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TWELFTH BIENNIAL REPORT

OF THE

STATE BOARD OF HEALTH

OF

CALIFORNIA,

FOR THE FISCAL YEARS FROM JUNE 30, 1890, TO JUNE 30, 1892.



SACRAMENTO:

STATE OFFICE, : : : : A. J. JOHNSTON, SUPT. STATE PRINTING.

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OFFICE CALIFORNIA STATE BOARD OF HEALTH, }
SACRAMENTO, September 15, 1892. }

To his Excellency H. H. MARKHAM, *Governor of California:*

SIR: I have the honor to present to you, in compliance with the laws of the State, the twelfth Biennial Report of the State Board of Health, for the fiscal years from June 30, 1890, to June 30, 1892.

Very respectfully,

J. R. LAINE, M.D.,
Secretary State Board of Health.

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MEMBERS OF THE CALIFORNIA STATE BOARD OF HEALTH.

TO APRIL 20, 1891.

President.

HENRY S. ORME, M.D. Los Angeles.

Secretary.

GERRARD G. TYRRELL, M.D. Sacramento.

W. R. CLUNESS, M.D. Sacramento.

R. BEVERLY COLE, M.D. San Francisco.

JAMES SIMPSON, M.D. San Francisco.

J. M. BRICELAND, M.D. Shasta.

C. A. RUGGLES, M.D. Stockton.

PRESENT MEMBERS OF THE STATE BOARD OF HEALTH.

W. G. COCHRAN, M.D. Los Angeles.

J. R. LAINE, M.D. Sacramento.

W. R. CLUNESS, M.D. Sacramento.

C. W. NUTTING, M.D. Etna.

C. A. RUGGLES, M.D. Stockton.

P. C. REMONDINO, M.D. San Diego.

OFFICERS OF THE BOARD.

W. G. COCHRAN, M.D. President.

J. R. LAINE, M.D. Secretary.

GENERAL REPORT OF THE BOARD.

To his Excellency H. H. MARKHAM, Governor of California:

SIR: Agreeable to an Act establishing a State Board of Health, and defining its powers, the twelfth Biennial Report of the State Board of Health is hereby submitted.

The purpose and ultimate object of establishing the California State Board of Health is the conservation and improvement of the public health. All the functions with which the Board may be endowed are specifically designed for the promotion and accomplishment of this end.

The law specifies that the Board must place themselves in communication with the local Boards of Health, hospitals, asylums, and public institutions throughout the State, and take cognizance of the interests of health and life among the citizens generally. They must make sanitary investigations and inquiries respecting the causes of disease, especially of epidemics, the source of mortality and the effects of localities, employments, conditions, and circumstances on the public health, and gather such information in respect to these matters as they may deem proper for diffusion among the people. They may devise some scheme whereby medical and vital statistics of sanitary value can be obtained, and act as an advisory Board to the State in all hygienic and medical matters, especially such as relate to the location, construction, sewerage, and administration of prisons, hospitals, asylums, and other public institutions. They must, at each biennial session of the Legislature, make a report, with such suggestions as to legislative action as they deem proper. It is also made the duty of the Board to examine into and report on the effect and use of intoxicating liquors upon the industry, prosperity, happiness, health, and lives of the citizens of the State, and what legislation, if any, is needed in the premises.

These specified duties are general in character, and make the functions of the Board purely advisory, with no mandatory authority over any condition or influence, however dangerous, which may threaten the health and life of the people of the State. In regard to the functions and duties of the Board, so far as they relate to any of the influences which affect public health, they are wholly performed when the Board suggests or advises what ought to be done. In other respects its function is that of a public educator, in teaching the precepts of health and the fundamental laws of public hygiene. This includes assistance and persuasion in organizing local Boards and calling attention to their duties and responsibilities, and indicating the direction which will make their efforts effective.

The only branch of public hygiene which, in the exercise of official function, possesses executive power to execute and enforce sanitary laws, is the local Board of Health. To bring the State and local Boards into a closer relation, tending to a uniformity of general action in sanitary work, will be the aim of the State Board.

The monthly reports of deaths and diseases published by the State Board are obtained exclusively from the Secretaries of local Boards, Health Officers, and physicians, who perform this work gratuitously for the public good. The Board is wholly dependent upon such sources of information for its knowledge of the condition of the health of the State. In order to utilize the information so received it is the custom to issue a

monthly circular, to all the local Boards of Health, and to such other citizens who may desire it, giving as accurate a statement of the condition of the public health during the previous month as can be made from the facts obtained. There has been an active interest and willing coöperation on the part of correspondents. It is the intention of the State Board to invite the local Boards and correspondents to meet in convention, to council as how best to increase the efficiency of the sanitary authorities of the State. As all real authority is vested in the local Boards, it is manifest that the greatest effectiveness will be reached by organization.

The remainder of the appropriation to exclude contagious diseases from the State amounted to \$5,982 45, July 1, 1890. Of this sum there remained unexpended on July 1, 1892, \$5,732 45. The maintenance of a Medical Inspector on the Oregon line during the epidemic of smallpox in British Columbia, in July and August, reduced the fund to about \$5,300.

ASIATIC CHOLERA.

In view of the rapid spread of Asiatic cholera in Europe, and the probability of its reaching the United States before the epidemic dies out, the advisability of making a generous appropriation for inspection and prevention purposes, at the State lines where railroads enter the State, is earnestly urged.

Should it become necessary to establish quarantine and refuge stations, there are four points that should be fully covered to make it effective. It would be necessary to place one on the Oregon line in the north; another near Truckee; another at The Needles, and another at Yuma. In addition to placing Inspectors at those points to inspect all trains, it would be necessary to provide for the establishment of hospitals of some character, either tents or temporary board shelters, with the necessary supplies of bedding, food, and medicine, to care for the sick and well while detained. It is impossible, at this time, to estimate how much it will be necessary to do; but, if an attempt be made towards the establishment of anything like a rigid land quarantine, it will involve the expenditure of a large amount of money. In addition, it is necessary to take into account the number of people it will be necessary to employ in carrying out these measures. It will also be necessary for the State to quarantine the port of San Pedro. Inspectors will not only need to be paid, but people engaged in fumigating cars, baggage, and other effects, and those employed in nursing the sick in quarantine camps will doubtless exact larger salaries than they would receive in ordinary employment. We believe that these contingencies will justify a large appropriation to be made, under such restrictions as the Legislature may deem advisable. The Board, therefore, in view of the situation at this time (September 15th), recommends that an appropriation of \$50,000 be made for the prevention of contagious diseases.

Very respectfully,

W. G. COCHRAN, M.D., President.
J. R. LAINE, M.D., Secretary.
C. A. RUGGLES, M.D.
C. W. NUTTING, M.D.
W. R. CLUNESS, M.D.
P. C. REMONDINO, M.D.

ABSTRACT OF PROCEEDINGS OF THE BOARD.

AS SHOWN BY THE MINUTES.

THE REGULAR QUARTERLY MEETING OF THE STATE BOARD OF HEALTH

Was held in the office of the Secretary, July 23, 1890.

Present—Dr. Orme, President; G. G. Tyrrell, Secretary; Dr. J. M. Briceland, Shasta; Dr. C. A. Ruggles, Stockton, and Dr. W. R. Cluness, Sacramento. Absent—Dr. Jas. Simpson and Dr. R. B. Cole, San Francisco.

The minutes of the last meeting were read and approved.

The Secretary reported that since the last meeting of the Board a communication had been received from the State Analyst, informing the Board that he was about leaving for Europe, and would be glad to represent it in the International Medical Congress to be held in Berlin, in August. As this was an opportunity for our Board to obtain, through Professor Rising, a report of the section on hygiene, I issued to him credentials as a delegate to the Congress from this Board, with a request that he report the proceedings.

On motion, the action of the Secretary was approved.

The Secretary reported that he had received a communication, accompanied by a long petition, from the citizens of Dunsmuir, requesting the Board to appoint a Health Officer for that town, the Supervisors refusing to do it, although it was claimed to contain five hundred inhabitants.

I wrote to the District Attorney, advising him of the request, and asking them to enforce the law. In reply I received the following:

YREKA, CAL., June 14, 1890.

G. G. TYRELL, M.D., *Secretary State Board of Health*:

DEAR SIR: Your communication of date of June 9th has been received. I have looked into the facts and situation fully, and have concluded that it would be well to advise you of same before taking action. There never has been a petition presented to our Board of Supervisors for the appointment of a Health Officer for the town of Dunsmuir, by affidavit, or otherwise; that the town of Dunsmuir contains five hundred or more inhabitants. The Supervisor from that district stated that he was satisfied that the town did not contain the required five hundred inhabitants. The only written application ever made was by Mr. J. N. White. This was only a request for the appointment, and contained no showing whatever that the town was entitled to such appointment.

In the absence of official knowledge, which they cannot have in this case, the Board should have some satisfactory proof as to the number of inhabitants, before acting. The Board, no doubt, as soon as satisfactory proof is given that Dunsmuir is entitled to the appointment of a Health Officer, will make the appointment. Members of the Board tell me that the only reason for not making the appointment was the absence of proof that Dunsmuir is entitled to the appointment, and that when that is forthcoming they will promptly make the same. Please reply.

Yours very respectfully,

J. D. BEARD.

On receipt of the above, I at once forwarded the petition of the citizens to be presented to the Board of Supervisors, with a request that immediate action be taken, which elicited the following reply:

G. G. TYRRELL, M.D., *Secretary State Board of Health:*

DEAR SIR: Received your letter yesterday, and also the petition forwarded to your Board from Dunsmuir. At the next meeting of the Board of Supervisors, I think that this matter will be adjusted satisfactorily. The Board meets on first Monday in July.

Yours truly,

J. D. BEARD.

Since that date the Board of Supervisors have met, but made no appointment. On motion of Dr. Briceland, the Secretary was instructed to wait until the official report of census was made, and then if it was ascertained that Dunsmuir contained the number of inhabitants to entitle it to a Health Officer, to have one appointed, which was carried.

The Secretary reported that he had requested the City Attorney of Monterey to have a Board of Health organized and a Health Officer appointed for Monterey. In reply he promised to attend to the matter without delay. Action approved.

The Secretary introduced to the Board a Mr. Schoonmaker, from Lodi, who desired to exhibit for the approval of the Board an adjustable bath-tub seat for the use of the sick. The invention consisted of a metal or iron standard fastened to the wall, upon which a slatted seat with adjustable rack was placed. Upon examination by the Board, it was of the opinion that under many conditions the invention was likely to prove useful, and had no hesitation in recommending its trial by hospital or private institutions.

The Secretary was authorized to convey the Board's opinion to Mr. Schoonmaker.

Dr. C. A. Ruggles, delegate to the National Conference of State Boards of Health, begged leave to report verbally his action. He stated, as preliminary, that on his way south he traveled with a Dr. Stevens, a practitioner in New Mexico, who informed him of the great prevalence of smallpox in El Paso and Deming and vicinity, so much so that merchants were leaving in affright.

Dr. Ruggles, deeming this information of the utmost importance to California, at once wrote to Dr. Tyrrell, advising him to take immediate steps to ascertain the extent of the epidemic, and to establish quarantine, with the consent of the Board, if necessary.

Upon arriving at Nashville he was, on making himself known, received most cordially by the delegates at the conference. The principal discussion of the conference was upon the necessity of teaching the public the value of sanitation, and it was considered that this object was better attained by short articles for the press upon sanitary subjects, and the assistance of Boards of Health pamphlets upon the different zymotic diseases, and on house ventilation, disposal of garbage, and kindred subjects.

Dr. Lée, of Philadelphia, presented a very able paper upon leprosy. His opinion was that the disease was only contagious through inoculation. On the contrary, one doctor held that the disease was neither infectious nor contagious, giving several facts in defense of his theory.

Dr. Orme's report on leprosy was next presented to the conference by Dr. Ruggles, but no conclusion was arrived at by the meeting.

The next subject under discussion was the Interstate Quarantine law. Dr. Ruggles explained fully the position of California in regard to this matter. Dr. Bryce, of Ontario, Canada, introduced the subject of disinfection in contagious diseases by the use of sulphurous acid, supporting his theory in a very plausible manner. Dr. Rutherford, of Texas,

combated Dr. Bryce's opinion, and explained that he had no faith in sulphurous acid, but firmly believed in the efficacy of chlorine gas and fire, especially in fire. Dr. Bryce then presented a valuable paper upon the effect of denudation of the land of forest trees.

The question of this Board upon the preservation of potable water from pollution was then brought forward by Dr. Ruggles, and after some discussion the conclusion arrived at was that the only way of preserving the potable waters was by preventing their pollution by stringent laws. Dr. Ruggles then presented the resolution of this Board asking the amalgamation of the conference with the American Public Health Association, which was immediately voted down as impolitic.

Upon adjournment of the conference, Dr. Ruggles proceeded to Washington, where he presented his letter of introduction to our Congressmen, Hon. T. J. Clunie and Hon. Marion Biggs, who received him most cordially and conducted him to President Harrison, to whom he explained the wants of this coast in the way of sanitary protection. From there Messrs. Clunie and Biggs took Dr. Ruggles to see Surgeon-General J. B. Hamilton. While conversing with this gentleman on the necessity of maintaining a strict quarantine on our southern border, a telegram was received from Dr. Tyrrell asking the appointment of a Government Inspector in New Mexico, as smallpox was reported epidemic. Surgeon-General Hamilton at once complied and telegraphed Dr. Tyrrell that he had appointed Dr. S. S. Herrick to the position.

Dr. Ruggles' verbal report was received and the thanks of the Board returned, with the request that Dr. Ruggles furnish a written report for publication in the next Biennial Report, which was carried.

The Secretary begged leave to report that, as detailed by Dr. Ruggles, he had received a letter from the doctor giving him an alarming account of the prevalence of smallpox in Mexico, and advising immediate steps be taken to prevent its extension to California. Your Secretary at once consulted Dr. Cluness, the only member of the Board available in an emergency, and he advised that I at once proceed to San Francisco and, if possible, engage the services of Dr. S. S. Herrick, and send him south and into Mexico to ascertain how far our State was threatened and to what extent smallpox prevailed. On arriving at San Francisco, I sought Dr. Herrick and obtained his consent to travel as far as El Paso, and points through Mexico and Arizona, at a salary of \$250 a month and expenses paid. I called upon the railroad authorities, explained to them the situation, and obtained every facility the railroad could offer to make the inspection complete. The Governor of the State at once consented to place \$1,000 at the service of the Board, out of the Contagious Disease Fund, of which sum your Secretary drew \$500, and on the 21st of May dispatched Dr. Herrick upon his mission. I herewith submit Dr. Herrick's report, which he will write out in full for the Biennial Report this year. The expenses and salary of Dr. Herrick for one month were \$398 40, leaving at the disposal of the Board \$101 60.

The Secretary's report was received, and his action unanimously indorsed.

The Secretary then read Dr. Herrick's report, which declared that, after careful inspection, he was of the opinion that although smallpox was undoubtedly present in Mexico and the valley of the Rio Grande, it did not immediately threaten California; but believing that it was epidemic in those places visited, and most likely to become epidemic when the

cold weather set in, California should have an Inspector constantly on the watch against the extension of the disease.

Dr. Herrick's report was received and accepted.

In view of the conclusion of the report, Dr. Cluness moved, and Dr. C. A. Ruggles seconded the motion, that it is the sense of this Board that a Government Inspector should be permanently located in the Rio Grande Valley, in the Territories of Arizona and New Mexico, for the protection of California from contagious and infectious diseases, and that Surgeon-General Hamilton be requested to make such appointment, at the expense of the National Government, which was unanimously carried, and the Secretary instructed to write Surgeon Hamilton without delay.

The Secretary reported progress in the codification of the health laws, but owing to the increased correspondence of the Board, which occupied his time, he would be unable to get them ready for incorporation in the Biennial Report without some clerical assistance.

On motion, the Secretary was authorized to employ the necessary assistance, in order to have the laws published in the Biennial Report.

In view of the increased correspondence of the Board, Dr. Cluness moved, which was seconded by Dr. Briceland, that the Secretary be authorized to purchase, for the use of the Board, a Remington or other first-class type-writer, which was carried.

Dr. Orme reported progress with his paper on leprosy for the Biennial Report, for which he had obtained some illustrative photographic views, but did not feel justified in going to the expense of having them lithographed for publication.

On motion of Dr. Cluness, seconded by Dr. Briceland, this Board authorized Dr. Orme to have his paper illustrated at the expense of the Board.

After discussion of various matters upon sanitation, there being no further business, upon motion, the meeting adjourned.

G. G. TYRRELL,
Secretary.

THE REGULAR MEETING OF THE STATE BOARD OF HEALTH

Was held in the office of the Secretary, October 11, 1890, at the usual hour.

Present—Dr. H. S. Orme, President; Dr. G. G. Tyrrell, Secretary; Dr. J. M. Briceland and Dr. C. A. Ruggles.

The minutes of the last meeting were read and approved.

The Secretary presented the following communication from the Stockton "Daily Republican:"

To the President and Members of the State Board of Health, Sacramento, California:

GENTLEMEN: The subscribers, publishers of the Stockton "Daily Republican," desire handling in the columns of their paper the live subjects of the day. In that connection they are pleased to say to your honorable body, and its members individually, that if you desire to furnish an article, or a series of articles, at least once a month, on health and its conditions on the Pacific Coast, or any other subject-matter pertinent to the knowledge and labors of your Board, which, in your judgment, would be of interest to the general public, the "Republican" will be pleased to publish it. Desiring a favorable reply, we are,

Your very obedient servants,

DORMER & RUGGLES,
Proprietors Stockton "Daily Republican."

It was moved by Dr. Briceland, and seconded by Dr. Tyrrell, that the communication be placed on file, its invitation be accepted, and that the thanks of the Board be returned to the gentlemen, through the Secretary, which was unanimously carried.

The following communication was received from Surgeon-General Hamilton.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING-GENERAL U. S. MARINE HOSPITAL SERVICE,
WASHINGTON, D. C., September 13, 1890. }

Dr. G. G. TYRRELL, Secretary State Board of Health, Sacramento, California:

SIR: I have respectfully to acknowledge the receipt, August 1st, of your letter containing a resolution of the State Board of Health of California, to the effect that a Government Inspector should be permanently located in the valley of the Rio Grande, in the Territories of Arizona and New Mexico, for the protection of California from smallpox and other infectious diseases, and that the appointment of said Inspector be requested of the Surgeon-General, Marine Hospital Service, the expense to be borne by the National Government. In the absence of Surgeon-General Hamilton, and because the request is for a permanent appointment, I have deferred taking action in the matter, but in the meantime have made inquiries concerning the smallpox in Mexican territory adjoining that of the United States, and in the valley of the Rio Grande. The whole matter will be brought to the attention of Surgeon-General Hamilton on his return from a tour of duty in Europe the present month.

By order of the Supervising Surgeon-General, Marine Hospital Service.

Respectfully yours,

WALTER WYMAN,
Surgeon M. H. S.

On motion, the communication was placed on file for further action.

A communication from Dr. Bailey, of Santa Ana, was read, complaining of the difficulty he had in having the health laws strictly obeyed, and asking some questions relating thereto. The Secretary read his reply thereto, which, on motion, was approved and the communication ordered on file.

The Secretary presented a manuscript copy of the health laws and ordinances as compiled by Dr. S. S. Herrick, and moved that the Board allow him a sufficient compensation for his labor.

It was, on motion of Dr. Ruggles:

Resolved, That the matter of compensation to Dr. Herrick be referred to a full meeting of the Board.

Carried.

Dr. Orme moved that the Secretary be requested to communicate with Dr. D. E. Salmon regarding the advisability of establishing a Board of the Bureau of Animal Industry upon this coast, for the purpose of considering the animal diseases prevalent in California, and adopting means for their suppression.

On motion of Dr. Briceland, seconded by Dr. Ruggles, the subject-matter was deferred until a fuller meeting of the Board was obtained.

In consideration of the various subjects which require the deliberation of a full Board, Dr. Briceland moved that when we adjourn we adjourn to meet in San Francisco on Monday evening at 8 o'clock, and the Secretary be requested to notify all the members of the San Francisco City Board of Health, and Health Officer, to meet with us in joint session for discussion on quarantine matters, legislation, and other subjects now pressing upon us, which was unanimously carried.

The Secretary reported progress with his Biennial Report, and expected to have it all in the printer's hands in a day or two.

On motion of Dr. Orme, the Secretary was requested to have two thousand copies of the report printed for general distribution.

There being no further business, the Board adjourned till Monday evening next.

G. G. TYRRELL, M.D.,
Secretary.

ADJOURNED MEETING OF THE STATE BOARD OF HEALTH

Was held in San Francisco, in the office of Dr. James Simpson, October 13, 1890.

Present—Dr. H. S. Orme, Dr. R. B. Cole, Dr. C. A. Ruggles, Dr. J. M. Briceland, Dr. G. G. Tyrrell, members of the State Board; Dr. Keeney, Health Officer of San Francisco, and Dr. Le Tourneux, Dr. Davidson, Dr. Fiske, Dr. McQuesten, members of the San Francisco Board of Health, by invitation.

The conjoined Boards met to discuss quarantine matters, as a precautionary measure against cholera.

Dr. Ruggles moved that the State Board should approve the action of the local Board in declaring Yokohama an infected port, and referred to Dr. Rucker, of Stockton, and others who have spoken slightly of this action, as quite underestimating its importance. This brought out a long and very interesting discussion of the subject of Asiatic cholera.

Dr. Le Tourneux said if anything, still greater precautions are necessary, as from latest accounts four fifths of the Chinese and Japanese attacked by the disease have died from it. San Francisco has never had a serious epidemic of cholera, and her location is such as not to favor the propagation of the disease. The duty of the Boards, however, extends to the country at large, as this city is the great gate through which orientals travel, and hence oriental infection would pass.

Dr. Cole said that unless something should be done the disease would make its appearance here, and having seen five thousand cases, he knows what a terrible calamity it is. The quarantine station, he said, is now so far advanced that a ship can be fumigated in from twenty-four to forty-eight hours, and the city can thus be protected. The apparatus, however, for disinfecting cargoes and baggage is not completed, but this, too, will be ready in from two to three weeks. In speaking of his experience with cholera, the doctor referred to a regiment which, under General (then Lieutenant) Grant, crossed the Isthmus of Panama in 1852, and of eight hundred soldiers but three hundred reached this city, the other five hundred having died of cholera on the way. Following in the strain of Dr. Le Tourneux, he said that the winds which blow across the San Francisco peninsula do not favor a spread of cholera, and that it thrives best in hot and damp atmospheres.

The motion of Dr. Ruggles, approving the efforts of the local Board, prevailed, and it was decided to visit the quarantine station on Sunday next with the express purpose, as Dr. Cole stated, of facilitating the completion of arrangements there, so that it may be speedily put in readiness to meet any exigency which may arrive.

The subject of the health of San Francisco was briefly discussed, and the action of the local Board, recommending the thorough flushing of

the sewers, was approved. The subject of quarantine was temporarily revived by Dr. Ruggles, and the Secretary was instructed to communicate with Surgeon-General John B. Hamilton, of Washington, asking as to the status of the quarantine station to be placed at San Diego, as provided by the Act of Congress.

Dr. H. M. Fiske then called the attention of the joint Boards to the growth of leprosy among white people in this State, and pointed out the necessity of a State hospital. He said that there were nine cases in this city, and the man who is most afflicted, a native of Massachusetts, has never been outside of the United States. Absolute isolation is essential to the prevention of a spread of the disease, and therefore a State Lazaretto, under the control of the State Board of Health, is imperative.

Other members of both Boards corroborated what Dr. Fiske said about the prevalence of leprosy.

The latter then moved that the State Board take cognizance of the need of a leper hospital, and recommended that measures be taken for introducing a bill in the Legislature, appropriating a suitable sum for the purchase of a site, and the erection of a suitable building.

Dr. Le Tourneux seconded the motion, and it was unanimously carried.

The fact that there is but one Market Inspector in this city was the next matter considered, and the risk from infected foods and tainted meats being sold and consumed was very clearly defined.

Dr. Cole then moved that a committee of five should be appointed to consider this and other matters, including the appointment of a State Veterinary Inspector. The motion was carried, and a rider, to the effect that the committee on legislation should report on October 27th, also prevailed.

President Orme then appointed the committee as follows: For the State, Drs. Simpson and Cole, and for the city and county, Drs. Fiske, Le Tourneux, and Davidson.

The visiting Board having retired, the subject of compensation to Dr. S. S. Herrick, for his labor in compiling the health laws of the State, was considered, and on motion, it was unanimously agreed to allow him the sum of \$75.

Meeting adjourned.

G. G. TYRRELL,
Secretary.

ADJOURNED MEETING OF THE STATE BOARD OF HEALTH

Was held in San Francisco October 18th, for the purpose of visiting and inspecting the new quarantine grounds and station at Angel Cove.

The following gentlemen formed the inspecting party: Drs. H. S. Orme, of Los Angeles, Charles Ruggles, of Stockton, R. Beverly Cole, of San Francisco, and G. G. Tyrrell, all of the State Board of Health; Drs. McQuesten, Fiske, Le Tourneux, and Davidson, of the San Francisco Board of Health; John Hoesch, Quarantine Officer Lawler, Health Officer Keeney, Dr. Bailhache, Dr. J. C. Tucker, of the United States Pension Board; Dr. William Martin, U. S. N.; Dr. Yeamans, City Physician; Dr. Sternberg, U. S. A., and Drs. Donnelly, Herrick, and Mackintosh.

The trip over was delightful. Arriving at the Cove the party was received by Colonel Bridges, who explained the plan of the station and escorted the visitors through the various buildings, nearly all of which are completed. At the wharf, where it is said two ocean steamers may be accommodated should occasion require, the concrete foundations are being laid on which will be placed the three large disinfecting boilers already described in the "Chronicle." The boilers are now on the wharf. The nearest building to the wharf is that known as the "barracks," where passengers of quarantined steamers will be accommodated during the disinfection of vessels and their cargoes. The house is much more comfortable than the name may imply. It has a frontage of 170 feet and a depth of 70 feet, and will be so fitted that none of the passengers who may be detained there will have cause for complaint.

Almost opposite the "barracks," on the side of the horseshoe which forms the pretty little cove, is the lazaretto where patients will be treated. It will accommodate about fifty patients. Joining it is a building in which will be located the dispensary and quarters of the nurses and attendants. Upon the hillside, some distance from the shore, are two buildings in which will be the quarters of the physicians and medical staff, the officers of the station, and the home of the Surgeon-in-Chief, who, it is said, will be Dr. Macintosh.

The visiting physicians inspected them, and expressed themselves as highly pleased with the plans of the station and the manner in which they have been carried out. They also paid particular attention to the water supply, which is obtained from a spring. The reservoir adjoining the spring holds about twenty thousand gallons. From it water is pumped to five tanks with a combined capacity of thirty-five thousand gallons. The flow from the spring is so strong, and constant that the two pumps in the engine house working together for eight hours have not emptied the reservoir.

After lunching in the old ranch house on the hillside where Colonel Bridges has his quarters, the physicians discussed the station, its condition and its needs at length. On motion of Dr. Cole, it was decided to be the consensus of opinion of the gentlemen present that, taking into consideration the topography of the site and its adjacency to a swift current, the suggestion of Dr. Bailhache, to have the offal from the station carried to the sea in pipes, is the most salutary and economical.

Dr. Bailhache explained that the offal would be disinfected before it was sent into the bay. The current in Raccoon Straits, one thousand feet from the station, is one of the strongest in the bay.

It was also resolved by the visiting physicians that the station and the site were all that could be desired, and that the Government officials in charge, and Colonel Bridges, the constructing engineer, should receive the greatest approbation for their work.

Dr. Cole called attention to the danger of infection from vessels coming from Chinese ports, and moved that a presentation of that fact be made to the Federal Government, with the request that the station be completed and opened for patients as soon as possible.

The motion was carried, and Drs. Cole, Ruggles, and McQuesten were appointed a committee to memorialize the Government.

Speaking on this question, Dr. Ruggles said he was assured that President Harrison would do everything possible to advance the station, as

he knew from a conversation he had had with him that the President had the interest of the coast at heart.

It was said also that many improvements would be introduced at the station not known at others, as Surgeon-General Hamilton had declared it his intention to make the station the model one of the country.

A portion of the party went around part of the island in Colonel Bridges' steam launch, and upon their return expressed their great delight at the site and all its surroundings.

The party returned to this city at 5 o'clock. On the homeward trip Lieutenant Runcie, U. S. A., representing General Gibbons, the "McDowell's" Captain, and Messrs. Bailhache and Bridges, were again thanked for having afforded the occasion for the enjoyable excursion.

The State Board then adjourned to meet in San Francisco when called upon by the legislative committee.

G. G. TYRRELL,
Secretary.

ADJOURNED MEETING OF THE STATE BOARD OF HEALTH

Was held in San Francisco December 29, 1890, to take into consideration, with the Legislative Committee of the San Francisco City Board of Health, what legal changes are necessary in our present health laws, and what additions thereto are absolutely necessary for the welfare of the State.

Present—Drs. Simpson, Cole, Ruggles, and Tyrrell, of the State Board, Drs. Le Tourneux and Davidson, of the City Board of Health, and Dr. S. S. Herrick, of San Francisco, by invitation.

Dr. Orme, the President, being unavoidably absent, Dr. R. Beverly Cole was unanimously voted to the Chair.

Dr. Tyrrell stated that some of our health laws imperatively demanded amendment to make them effective, and proposed submitting to the Legislature an Act to amend Section 3064 of the Political Code, whereby the words "eighteen hundred and eighty-seven" will be changed to "eighteen hundred and ninety-one," and thus remove the objection to it which now renders it legally inoperative. He also proposed to reintroduce the Act amending Sections 3077, 3078, 3080, and 3082 of the Political Code giving compensation for the filing of deaths, births, and marriages; and also an amendment to Sections 337 and 378 of the Penal Code, substituting the word "knowingly" for "willfully." These are all the amendments he proposed asking for.

It was also proposed to introduce an Act appointing a State Sanitary Inspector; also an Act appointing a State Veterinary Surgeon; also an Act to establish a State Hospital for Lepers; also an Act to replenish our Contagious Disease Fund; also to place \$5,000 on the apportionment bill for the State Analyst, and to amend the Act establishing a State Board of Health by amending a section giving its members \$10 a day, in addition to their traveling expenses, when on duty for the State.

Dr. S. S. Herrick read a communication from Dr. H. S. Orme, in which the following amendments were considered: Chapter 24, 1889, relative to vaccination, has no penal clause. Section 377, Penal Code, was amended in 1889, so as to restrict its application to violation of the Act relating to registration of deaths and disposal of dead bodies. Its full

application should be restored, so as to reach violations of all sanitary laws.

The execution of the Act of 1889, relating to the sanitary condition of factories, shops, etc., was placed in the hands of the Commissioner of Bureau of Labor Statistics, but no extra funds or employes were provided for. Its execution should be vested in local health authorities.

A new section (2984) should be added to the Political Code, providing for a State Sanitary Inspector; also, another (2985) providing for a State Veterinarian.

A general Act is needed empowering all cities having Boards of Health or Health Officers, and a population of not less than five thousand, to have one Health Inspector; cities having a population of not less than thirty thousand, to have one Health Inspector and one Market Inspector; cities of more than thirty thousand, to have one Health Inspector for every thirty thousand inhabitants, and one for the residual fraction above one third of that number, and one Market Inspector for every sixty thousand inhabitants, and one for the residual fraction above one third of said number.

An Act is needed to establish a State Leper Hospital; the site to be selected and buildings erected under the advice and supervision of the State Board of Health; the Medical Officer and employes to be chosen by said Board; annual expenses to be provided by the State, but every county to be charged pro rata with the expenses of patients sent to the hospital.

These several suggestions having been discussed by the members present, it was agreed, at the suggestion of Dr. Ruggles, that a penal clause be added to the Vaccination Act, by making a disregard of the law sufficient cause for deprivation of the school appropriation for that district so long as disobedience is continued.

It was resolved to allow the sanitary condition of factories to continue in the hands of the Labor Bureau until a more convenient season for taking it up.

It was also agreed that the matter of a State Veterinarian be referred to the Veterinary Association for action.

The Sanitary Inspector was agreed upon. The Inspector bill was modified so as to omit the clause of five thousand, and commence with cities of ten thousand or more inhabitants. It was also proposed that we ask for \$10,000 for a leper hospital.

Dr. Cole thought we had no right to ask for \$5,000 for the State Analyst, as the mineral waters of the State belong to individuals, and the State has no authority to use its funds for the benefit of individual owners.

After some further discussion on ways and means, the meeting, on motion, adjourned.

G. G. TYRRELL,
Secretary.

THE REGULAR QUARTERLY MEETING OF THE STATE BOARD OF HEALTH

Was held in the office of the Secretary, January 13, 1891, at the usual hour. Present—Dr. H. S. Orme, President; G. G. Tyrrell, Secretary; Dr. J. M. Briceland, Dr. C. A. Ruggles, Dr. W. R. Cluness, members, and Dr. S. S. Herrick, by invitation.

The minutes of the last meeting having been read and approved, the Secretary read a telegram from Surgeon-General Hamilton, relating to the quarantine in San Diego, as follows:

WASHINGTON, D. C., October 15, 1890.

Dr. G. G. TYRRELL, Secretary State Board of Health, Sacramento, Cal.:

Time thus far has been consumed in getting site, several having been selected and possession refused. Good site finally purchased, and plans for buildings are now in preparation.

J. B. HAMILTON,
Surgeon-General.

A reply was sent by Dr. C. A. Ruggles to a communication addressed to Surgeon-General Hamilton, by the committee appointed for that purpose, at the meeting of the conjoined Boards of Health, held in San Francisco, October 18th, relative to finishing the quarantine station at Hospital Cove, Angel Island, stating:

"That an additional appropriation had been asked of Congress for the building of the boarding steamer, and the completion of the building omitted from the plan on account of lack of appropriations."

It was moved by Dr. Ruggles that the subscription of the Board to "Sanitary Record" be renewed and the bill paid. It was also moved that the bill for subscription for "Sanitarian" be paid, and our subscription for one copy be renewed.

A communication from the Lorin Sanitary District, and the action of the Secretary regarding the disposition of the matter, was approved.

A communication from E. O'Brien, Health Officer at Merced, stating that a leper was discovered on Merced River and asking how he could dispose of him. The Secretary replied that the county would have to care for him, as the State had made no provisions for such cases, as the county was usually responsible for his isolation and safe keeping.

On motion, the reply of the Secretary was indorsed and his action approved.

On motion of Dr. J. M. Briceland, seconded by Dr. Cluness, the Secretary was instructed to draw up a bill to procure a fund for prevention of contagious and infectious diseases, which is necessary for our protection.

On motion of Dr. Briceland, seconded by Dr. Cluness, the Secretary was instructed to prepare a bill for the erection of a leper hospital and the purchase of a site.

On motion of Dr. Cluness, the Secretary was instructed to urge the passage of the bill appointing a State Sanitary Inspector.

Dr. Cluness moved that an Act be prepared to amend Section 378 of the Penal Code, by inserting the word "knowingly" for "willfully," which was carried. Also, to amend Section 3064 and Section 3077 of the Political Code, which were carried.

The Secretary was also instructed to amend the Act organizing a State Board of Health, by adding a section giving the members \$10 a day while engaged in the duties of the Board.

On motion of Dr. Orme (Cluness in the chair), seconded by Dr. Briceland, the following resolution was adopted:

Resolved, That the Secretary of this Board be instructed to communicate with Hon. D. E. Salmon, Chief of United States Bureau of Animal Industry, and with our Senators and Representatives in Congress, to the end that a branch of said Bureau may be established in California, inasmuch as no such branch now exists west of the Rocky Mountains.

Which was unanimously carried.

There being no further business, on motion of Dr. Briceland, the meeting adjourned.

G. G. TYRRELL,
Secretary.

THE REGULAR QUARTERLY MEETING OF THE STATE BOARD OF HEALTH

Was held in the office of the Secretary on April 20, 1891.

Present—Dr. W. R. Cluness, Dr. C. A. Ruggles, Dr. J. M. Briceland, Dr. G. G. Tyrrell, Dr. H. S. Orme, Dr. R. B. Cole; and by invitation, Dr. J. R. Laine, Dr. P. C. Remondino, Dr. C. W. Nutting, and Dr. W. G. Cochran.

The minutes of the last meeting having been read and approved, the Secretary read the following communication from the Bureau of Animal Industry in reply to the communication requesting the organization of a branch of the Bureau west of the Rocky Mountains:

WASHINGTON, D. C., March 11, 1891,

Dr. G. G. TYRRELL, Secretary State Board of Health, Sacramento, Cal.:

DEAR SIR: I am in receipt of your favor of the 2d instant, transmitting resolution adopted by your Board, requesting you to communicate with me with the object of having a branch of this Bureau established in California. In reference to this I would say that the work of this Bureau is carried on by stationing inspectors or agents in localities where any line of work which we have in charge needs to be carried on. As we have a number of different lines of work, such as the scientific investigation of diseases, the eradication of pleuro-pneumonia, the inspection of animals and meats for export, etc., I would be glad to hear further from you as to the line of work that your Board thinks the Bureau should undertake in California.

Very respectfully,

D. E. SALMON,
Chief of Bureau.

It was moved that the communication be received and the matter be referred to the incoming Board. Carried.

The following communication was read by the Secretary and ordered placed on file:

OFFICE OF THE IOWA STATE BOARD OF HEALTH,
DES MOINES, April 1, 1891.

To all Undertakers and Railroad Companies:

By reason of the frequent shipment of the bodies of persons dead from diphtheria, under the statement that the cause of death was "heart failure," or some other sequelae of that disease, and non-contagious, thereby greatly endangering human life, at a meeting of the Iowa State Board of Health, held Thursday, November 20, 1890, it was ordered that the transportation of the bodies of persons dead from diphtheria be prohibited in this State, and that the word "diphtheria" be stricken out from Rule 2, of the Rules and Regulations for the Transportation of Corpses, and that the word "diphtheria" be inserted in Rule 1, after the word "smallpox." Undertakers, baggagemen, and railroad station agents are hereby notified to govern themselves accordingly. The following resolution was also adopted:

"Resolved, That a return of a death made by a physician giving 'heart failure' as a cause of death, shall not be deemed a sufficient return, and such must be returned to the physician who made it for the proper correction and definition."

J. F. KENNEDY, M.D.,
Secretary.

Dr. R. Beverly Cole then moved that the above communication from the State Board of Health of Iowa be indorsed, and trust that the incoming Board will take such steps in respect to the resolution contained therein as will do away with the vagueness of certificates of death stat-

ing the cause of death to be "heart failure," "dropsy," "fever," "child-birth," "colds," etc., which was unanimously carried.

An invitation to appoint delegates to the National Conference of State Boards of Health was received and referred to the new Board for action. Same disposition was made of invitation to attend International Congress of Hygiene.

The attention of the Board having been called to a quack advertisement, as follows:

The State Board of Health, appointed by the Governor of California (and composed of physicians) to see that none practice medicine or surgery in this State without they are perfectly qualified to do so, have examined the diplomas of the New York specialists and declare them correct, and authorize them to practice medicine and surgery in California, and they hold certificates from the State Board of Health of California to that effect.

It was moved by Dr. Cluness, and seconded by Dr. Cole, and carried, that the Secretary be instructed to contradict, by telegraph to the San Diego "Union," the above untruth.

The Secretary then read the following telegram, which, having been signed by each member of the Board, was at once dispatched to San Diego, the present quarters of the "New York Specialists:"

OFFICE STATE BOARD OF HEALTH.

To San Diego "Union.":

The statement advertised by parties calling themselves "The New York Specialists," that they hold certificates from the State Board of Health of California, entitling them to practice medicine and surgery in the State, is absolutely false, malicious, and calculated to deceive the public.

The following communication from the American Public Health Association was ordered received and placed on file:

To G. G. TYRRELL, Secretary State Board of Health, Sacramento, Cal.:

DEAR SIR: At the eighteenth annual meeting of the American Public Health Association, held at Charleston, S. C., December 16-19, 1890, the following vote was passed: Voted, to instruct the Secretary to advise each State Board of Health which has not already done so, to issue directions to all local Boards of Health and Health Officers in reference to the preparation and proper use of disinfectants, basing such directions upon the reports of the Committee on Disinfectants of the Association.

Respectfully submitted.

IRVING A. WATSON,
Secretary.

The following gentlemen having been appointed by Governor Markham as members of the State Board of Health, presented their credentials, which were received, and the members welcomed to their seats by President H. S. Orme: Dr. C. W. Nutting, of Etna Mills, vice Brice land, term expired; Dr. P. C. Remondino, of San Diego, vice J. M. Simpson, term expired; Dr. W. R. Cluness, vice self, unexpired term; Dr. C. A. Ruggles, vice self, term expired; Dr. J. R. Laine, vice Tyrrell, term expired; Dr. W. G. Cochran, of Los Angeles, vice R. B. Cole, term expired.

It was moved and seconded that Dr. Tyrrell be requested to act as Secretary during the organization of the new Board. Carried.

Nominations for President being in order, Dr. Ruggles offered the name of W. G. Cochran, of Los Angeles, for that position. Nominations were closed and ballot ordered, six votes being cast. Dr. Cochran received five, and Dr. Ruggles one. Dr. Cochran, having received a majority of the votes cast, was declared duly elected President.

Nominations for Secretary being in order, Dr. Cluness was placed in

nomination by Dr. C. W. Nutting. Dr. J. R. Laine was nominated by Dr. P. C. Remondino. Ballot being ordered, six votes were cast. Dr. Cluness received one vote, and Dr. Laine received five votes. Dr. Laine having received a majority of the votes cast, was declared duly elected to the office of Secretary of the Board.

G. G. TYRRELL, M.D.,
Secretary.

THE REGULAR MEETING OF THE STATE BOARD OF HEALTH

Was held at 10 P. M., April 20, 1891.

There were present C. A. Ruggles, of Stockton; W. G. Cochran, of Los Angeles; P. C. Remondino, of San Diego; C. W. Nutting, of Etna Mills, and W. R. Cluness and J. R. Laine, of Sacramento.

The meeting was called to order by Dr. C. A. Ruggles, who appointed Dr. G. G. Tyrrell, the late Secretary, to act as Temporary Secretary.

The first business in order being the election of a President, Dr. C. A. Ruggles placed Dr. W. G. Cochran in nomination, and he was unanimously elected.

Upon taking the chair, Dr. Cochran declared the next business in order to be the election of a Permanent Secretary. Dr. C. W. Nutting placed Dr. W. R. Cluness in nomination, and Dr. P. C. Remondino nominated Dr. J. R. Laine. A canvass of the ballots showed six votes to have been cast, one of which was in favor of Dr. Cluness and five in favor of Dr. J. R. Laine. The President thereupon declared Dr. Laine duly elected Permanent Secretary of the State Board of Health.

Dr. Ruggles then moved that the Secretary be instructed to obtain a correct census report of cities and towns furnishing mortuary reports, and to compute the percentage of deaths from such corrected reports. The motion was adopted, as was also the motion by Dr. Ruggles to instruct the Secretary to announce to local Boards of Health that reports giving heart failure, dropsy, colds, childbirth, and such like vague terms as causes of death in their monthly mortuary tables, will not be regarded as sufficient nor satisfactory; and that a recommendation be made that specific terms, such as are recognized in medical nomenclature, be invariably employed to designate the cause of death.

Dr. Ruggles gave notice that he would bring up Section 2979 of the Political Code for discussion at the next meeting, so as to get a better understanding as to the legal rights and status of the State Board of Health with reference to the sanitary requirements of the various public institutions receiving State aid and support.

The Board then adjourned, to meet at the office of the Secretary at 9 A. M., April 22d.

J. R. LAINE,
Secretary.

AN ADJOURNED MEETING OF THE STATE BOARD OF HEALTH

Was held at 9 A. M., April 22d, at the office of the Secretary, there being present Drs. Cochran, Remondino, Nutting, Ruggles, and Laine.

The minutes of the previous meeting were read and approved. It was

ordered that the codified laws of California relating to sanitary affairs should be obtained from the State Printing Office and properly distributed.

The Board, after a further discussion of matters relating to perfecting its efficiency, adjourned until the quarterly meeting in July.

J. R. LAINE,
Secretary.

THE REGULAR QUARTERLY MEETING OF THE STATE BOARD OF HEALTH

Was held at the office of the Secretary on July 6, 1891, at 8 p. m.

There were present Drs. Cochran, Ruggles, and Laine. Communications from Drs. Remondino and Nutting were read, giving reasons for their absence.

The minutes of the last meeting were read and approved.

The resignation of Dr. Julius Rosenstirn was read and ordered placed on file.

Dr. P. C. Remondino was duly elected a delegate to represent the State Board of Health at the meeting of the American Public Health Association to be held at Kansas City, Mo., in October, 1891.

There was a lengthy and earnest discussion of various matters relating to public sanitation, after which the Board adjourned, to meet at the call of the President.

J. R. LAINE,
Secretary.

THE STATE BOARD OF HEALTH MET IN REGULAR SESSION

At 8 p. m., October 19, 1891.

Present—Drs. W. G. Cochran, C. W. Nutting, C. A. Ruggles, and J. R. Laine.

The minutes of the previous meeting were read and approved.

The Secretary, Dr. J. R. Laine, reported having made an official visit to the town of Willows, on account of an outbreak of diphtheria. This action was approved.

The matter of a change in blanks for reporting deaths and diseases was, after a lengthy discussion, left to the discretion of the Secretary.

The Board then resolved to adjourn until the next day, in order to make a sanitary survey of the Folsom State Prison, the Stockton and Napa Asylums for the Insane, the San Quentin State Prison, the State University, and the Berkeley Asylum for the Deaf, Dumb, and Blind, and to adjourn from day to day until the surveys are finished.

FOLSOM PRISON.

The State Board of Health, consisting of Drs. Cochran, Nutting, Ruggles, and Laine, met at the Folsom State Prison on October 20, 1891, to inquire into its sanitary condition.

The condition of the convicts and the ventilation of the cells and buildings were carefully inspected and found to be good. The food supplies, including vegetables and bread, were of good quality, the food well cooked, and the dining-room and kitchen were in a creditable condition.

The prison drainage is of an ancient pattern, being a sewer running the length of the building, having wooden blocks opening in the middle of the wards, with no ventilation except into the buildings.

All liquid and solid refuse passes into this drain, which discharges its contents about three hundred feet in a northerly direction into the American River.

Warden Aull explained that he had under consideration an elaborate and well-considered plan for plumbing and draining the prison, with due provisions for ventilating the sewer outside of the buildings. The plan, as shown in a diagram submitted to the Board, is suitable, and will, when completed, free the prison from all danger from sewer gases. It is ascertained upon inquiry that, notwithstanding the imperfect system of drainage now in use, no diseases traceable to this as a cause have been noted. This is doubtless due to two facts: the perfect ventilation in the roofs of the buildings, and the rapid flow of the sewage and shortness of the sewer.

The sewer empties directly into the river, with no attempt to precipitate or detain its solid contents. This state of things, if long continued, must, in no small degree, pollute the water which is used for domestic purposes by forty thousand people within a distance of twenty miles.

In view of this condition, the following preamble and resolutions were unanimously adopted and ordered placed upon the minutes:

WHEREAS, The sewage of the Folsom State Prison flows directly into the American River twenty miles above Sacramento, which city obtains its water supply for public and domestic uses at a point immediately below the confluence of that stream with the Sacramento River; therefore, be it

Resolved, That the State Board of Health advise a discontinuance of this practice as detrimental to the public health and a violation of law; be it further

Resolved, That a recommendation be made that settling or chemical precipitation tanks be constructed at the outflow of the sewer, so that nothing but water deprived of injurious qualities shall be permitted to flow into the American River, and that the solid substances be precipitated and removed, and utilized as fertilizing material on the prison farm; and be it further

Resolved, That a copy of these resolutions be transmitted to George A. Knight, the attorney for the State Board of Health, with instructions to enforce a compliance with these recommendations.

STOCKTON INSANE ASYLUM.

The State Board of Health, consisting of Drs. Cochran, Nutting, Rugles, and Laine, met at the Stockton Asylum for Insane on October 21, 1891.

An inspection of the food supplies showed them to be of good quality. The kitchen was well furnished, but the windows and doors were unscreened and flies swarmed in myriads.

The same condition existed with reference to the bakery and dining-room for employes and the dining-room for patients.

The food was well cooked and was served in abundance. There was ample evidence that the management is kind, humane, and in a high degree creditable. The buildings are large, airy, and generally clean. The grounds are spacious, and, except in the rear of the kitchen where rags and bits of torn sacks and other refuse lay scattered around, are well kept. What meat was found in a screen meat stall was of prime quality, but the stall, notwithstanding the screen, contained many flies.

The water-closets are in detached buildings, and great efforts have been made to overcome the fatal error of locating such an institution where there is no fall for drainage. The closets are well kept and free from injurious odors.

The system of sewerage in use entails constant supervision and labor. Soil and waste pipes convey the sewage to branch sewers, converging to the main sewer, where it flows with sluggish current to a large catch-basin eighteen feet in depth. The sewers are constructed of redwood boards, and have square man-holes at about every hundred feet. In order to keep them pervious men are daily employed in floating a bit of wood, to which is attached a cord, from one man-hole to the other next below, and then dragging that section with a bundle of sacks. The last constructed building is sewerred with vitrified stone pipe, ventilated by square box man-holes. The sewage flows into the box sewer, whence it is discharged into the catch-basin, where a stationary engine pumps it into raised box flumes, which conveys it, diluted with artesian water, to adjacent vegetable gardens as combined irrigation and fertilizer. During the winter it continues its flow to a canal two miles distant, which leads to tide water.

So far no objection has been raised by neighbors to the use of sewage as fertilizing fluid. Neither need there be objection where such irrigation is sufficiently remote from habitations that it cannot offend the senses. One flume, however, carries sewage several hundred feet northerly and then westerly to within one hundred feet of the southern extremity of the building occupied by female patients, where it is used to irrigate a plat of alfalfa. Along its entire length it leaks badly, the fluid spreading out on either side of the flume, offensive to both sight and smell.

Believing that the maintenance of this raised flume and the irrigation with sewage in such proximity to the structure occupied by the female patients is, or might be, injurious, the Board unanimously adopted the following resolution:

Resolved, That the Secretary of the State Board of Health is hereby instructed to communicate with the Superintendent of the Stockton Asylum for the Insane, calling attention to an open flume carrying sewage to an alfalfa patch on the south side of the building occupied by female patients, and recommending a discontinuance of this practice and the removal of the flume; substituting therefor an iron or vitrified stone pipe sunk in the ground; and that no surface irrigation be practiced in close proximity to the buildings occupied as habitations, except with water uncontaminated with sewage.

NAPA INSANE ASYLUM.

Drs. Cochran, Nutting, Ruggles, and Laine met at the Napa Asylum for the Insane on October 22, 1891, for the purpose of making a sanitary survey.

The kitchen, dining-rooms, and bakery were in excellent condition. The food supplies were of good quality, and appeared to be served in a palatable condition and in abundance. The fresh meats are subjected to refrigeration four days before using.

The site is admirably chosen for such an institution. The architectural proportions of the building, their external beauty of design and finish, harmonize with the beautiful grounds, which are adorned with choice shrubbery, and grace the broad avenue leading to the entrance of the buildings.

The asylum is overcrowded. The system of sewers for the institution is of vitrified stone pipe, laid in the basement from each water-closet to the central sewer, which leads to an open field remote from the building.

The pipes underneath the buildings often clog and burst, requiring frequent disturbance, which, in a degree, vitiates the atmosphere of the

basement. This would not be serious, inasmuch as it is freely ventilated, were it not that the heating apparatus is situated here, and the air used for heating the building obtained from the basement, and not from where it should be—the open air.

These faults are susceptible of removal by the single expedient of constructing water-closets and lavatories in the court, separate from the main building, but communicating with them, and abandoning all the water-closets in the main buildings. This would relieve the overcrowding by one hundred persons. By taking up the sewer and soil pipes now in the basement, and extending the main sewer in the most direct line to the new outside closets on to the smokestack of the powerhouse, the sewer would be complete. The waste pipes should be provided with a catch-basin, leaving an air space. That portion of the sewer which passes underneath the building should be of iron. The basement floor should be bituminized. These improvements would relieve the plethora, purify the basement, furnish improved closets, free the dormitories from sewer gases, and put a stop to the nuisance of breaking the clogged soil and sewer pipes underneath the buildings.

The Secretary was instructed to communicate with Superintendent Gardner, embodying the views of the State Board of Health, and urging that the Board of Directors for the Napa Asylum be importuned to put in execution the recommendations therein contained with the least possible delay, so that the improvements may be completed, if possible, before the rainy season sets in.

SAN QUENTIN STATE PRISON.

The State Board of Health, consisting of Drs. Cochran, Ruggles, Nutting, and Laine, met on October 23, 1891, for the purpose of inspecting the San Quentin State Prison.

The location of the prison is well chosen for drainage and salubrity. The arrangement of the buildings and their manner of construction show that they have been erected at different periods. A painful lack of harmony prevails in the appearance of the structures.

The fall for drainage is ample, and the plumbing, though not of modern construction, is nevertheless sufficient for present uses.

A water-closet in the tailor shop directly over the bakery is in bad condition, and should be speedily overhauled. The yard closet is of primitive construction, and too deep, and the building inclosing it is too low. Both could be remodeled at a trifling expense, so as to secure increased comfort and better ventilation.

The cells were clean and well ventilated, the yards were well policed, and everything about the grounds showed careful supervision. There was some objection to the wooden pails for night use in the cells, as they absorb the contents, and notwithstanding careful rinsing, are offensive to the smell. It was the opinion of the Board that they should be replaced, when convenient, with galvanized iron vessels.

A careful inspection of the food supplies was in every way favorable. The vegetables, bread, and meat were good. The food served at mid-day was well cooked and abundant. The general dining-room is, however, too dark and damp. The kitchen, though of ample dimensions for all culinary purposes, is totally unfit for the purpose. It is so dark as to require gas light at noon of a sunny day. Light comes in from

the west side only, where the sun is shut out by a four-story building. The east wall is blank, and drips with moisture, which collects in puddles on a badly-patched cement and bituminous floor, requiring constant sweeping and mopping to keep it dry. Ventilation is altogether inadequate, and the steam from the boilers condenses on the cold walls, increasing the discomforts and dismal appearance of the place.

The kitchen should be either removed to a more suitable place, or the east wall should be uncovered and pierced with windows for light and ventilation. This can be done by bulkheading ten feet of space outside of the east wall, which can then be perforated for windows. This space should be drained by a pipe running under the kitchen floor, and the floor covered with concrete.

If, in addition to these improvements, which may be deemed all that are necessary, the high building that obscures the sun on the west side were removed, the kitchen would be in a very good condition. As it now is, it is totally unfit for the purpose which it serves, and is, moreover, a disgrace to the institution.

STATE UNIVERSITY, BERKELEY.

The State Board of Health met at Berkeley, October 24, 1891. There were present Drs. Cochran, Nutting, Ruggles, and Laine.

The State University buildings were not fully inspected, owing to lack of time. Sufficient information was, however, elicited from the Secretary of the Board of Regents to determine that a deficiency of water exists, necessitating the closing of all the water-closets adjacent to the University class-rooms during a great portion of the summer months. This condition borders on the scandalous, and amounts to a positive nuisance, which should admit of no loss of time in abating.

If the University plant is inadequate to supply the requirements of the institution, enough should be purchased from neighboring water companies to supply all needs.

It is difficult to realize how there can be a valid excuse for closing the closets of the University during term, when water is obtainable by purchase. The chief institution of learning belonging to the State should not be permitted to languish from want of water. The Board of Health is not in possession of sufficient data to determine what should be done in the premises, but it does strongly advise the procurement of an ample supply of water at any cost. It is not within the province of the Board to indicate how this should be done.

DEAF, DUMB, AND BLIND ASYLUM.

This institution was found to be in such an excellent condition as to require no extended comment. The grounds are admirably kept. The buildings are imposing and spacious, and the plumbing and drainage are of a modern and approved pattern.

The Board then adjourned until evening, when it again convened at the Palace Hotel in San Francisco, to consult with George A. Knight, the attorney for the State Board of Health.

After fully considering the work that had been done, the Secretary was instructed to communicate with the management of the different institutions visited by the Board, furnishing such recommendations as

had been made, and disclaiming all intention to pass strictures upon those in authority, or to disparage the efforts of those in charge, and expressing also a full apprehension of the many obstacles in the way of placing State institutions in an ideal condition.

The Board then adjourned until the next quarterly meeting in January, 1892.

J. R. LAINE,
Secretary.

THE REGULAR QUARTERLY MEETING OF THE STATE BOARD OF HEALTH

Was held at the office of the Secretary on January 18, 1892, at 8 P. M.

There were present Drs. Cochran, Ruggles, and Laine. Letters were read from Drs. Nutting and Remondino, stating reasons for non-attendance, and promising to be present at the next regular meeting in April.

The minutes of the last meeting were read and approved.

Communications were read from Benjamin Lee, Secretary Pennsylvania State Board of Health, which were ordered placed on file, to be answered by the Secretary at his convenience.

A letter from H. N. Rucker, Medical Superintendent of the Stockton Insane Asylum, was ordered placed on file.

The Secretary was instructed to ascertain and report at the next regular meeting what has been done toward a compliance with the recommendations made by the State Board to the different public institutions with reference to their sanitary condition.

The Board then adjourned to meet in April.

J. R. LAINE,
Secretary.

THE REGULAR QUARTERLY MEETING OF THE STATE BOARD OF HEALTH

Was held at the office of the Secretary at 8 A. M., April 18, 1892.

There were present Drs. C. A. Ruggles and J. R. Laine.

There being no quorum, the meeting adjourned to convene at the call of the President at San Francisco the next day.

J. R. LAINE,
Secretary.

THE STATE BOARD OF HEALTH MET IN REGULAR ADJOURNED SESSION

At the Palace Hotel at 9 A. M., April 19, 1892.

There were present Drs. W. G. Cochran, P. C. Remondino, W. R. Cluness, C. A. Ruggles, C. W. Nutting, and J. R. Laine.

The minutes of the previous meeting were read and approved, also those of the adjourned meeting of the 18th.

The President stated that the purpose of holding a meeting in San Francisco was to hold a conference with the San Francisco Board agreeable to a request made six months before, and to discuss matters relating to coming legislation, which should be prepared for the session of the Legislature. It was also desirable, after meeting the San Francisco Board, to visit, if possible, the quarantine station on Angel Island in

San Francisco Harbor; also the Insane Asylum at Agnews and the State Normal School at San José.

The Secretary was instructed to confer with the San Francisco Board of Health and arrange for the meeting of the two Boards, and report at 9 A. M. Wednesday, April 20th.

The Board then adjourned until the next day.

J. R. LAINE,
Secretary.

THE STATE BOARD OF HEALTH MET IN REGULAR ADJOURNED SESSION

At the Palace Hotel, at 9 A. M. April 20, 1892.

There were present Drs. Cochran, Ruggles, Nutting, Remondino, and Laine.

The Secretary reported having made all possible efforts to have an early conference with the San Francisco Board of Health, but that the earliest date obtainable was 9 A. M. April 21st, at the City Health Office, in the City Hall.

The President expressed regrets that the meeting could not be held sooner, as the hour and date fixed would not admit of the Board leaving the city to complete the sanitary survey of the State buildings until after Thursday.

The Board then adjourned to meet at the San Francisco Health Office at 9 A. M. April 21, 1892.

J. R. LAINE,
Secretary.

THE STATE BOARD OF HEALTH MET IN REGULAR ADJOURNED SESSION

At the San Francisco Health Office at 9 A. M., April 21, 1892.

There were present Drs. Cochran, Ruggles, and Laine, of the State Board, Mayor Sanderson, Drs. M. Regensburger, S. F. Long, Geo. J. Bucknall, Health Officer James Keeney, Quarantine Officer Lawler, and attachés of the local health office.

Mayor Sanderson invited the State Board to address the conference on any subject that should properly come before the joint bodies.

President Cochran stated that in addition to the natural desire to meet, officially as well as personally, the members of the local Board, there were important subjects to be considered with reference to presenting bills relating to sanitary affairs to the next Legislature. If it should be determined to attempt any advancement in sanitary legislation, the measures proposed should be well considered, and the bills prepared in advance.

Dr. C. A. Ruggles believed that the State was in need of a hospital for lepers; that as matters now stood lepers were either allowed to remain at their homes with their families, or they are maintained in county pesthouses. He favored legislation which will provide a suitable retreat for lepers, to be maintained by the State.

Dr. Regensburger also favored such a course, but would go further, by providing also an asylum for incurables of all kinds. He believed that San Francisco received an undue proportion of incurables of the indigent class, so much, in fact, as to tax seriously the capacity of available accommodations for their comfort.

On motion of Dr. Cochran, the Mayor was authorized to appoint a committee of five, three from the State Board and two from the San Francisco Board, to confer with Geo. A. Knight, the attorney for the two Boards, and prepare a bill meeting the necessities of the situation, and cause the same to be introduced in the Legislature, and to use all honorable means in furthering its passage, until it becomes a law.

The Mayor appointed Drs. Cochran, Ruggles, and Laine, of the State Board, and Regensburger and Long of the San Francisco Board, to meet at the call of the Chairman.

Dr. Regensburger introduced a resolution disapproving the custom of baring the head at funerals, and cited a number of casualties resulting from the practice during the last two winters. The resolution was adopted, and the matter was referred to the Secretary of the State Board for further action.

The State Board, accompanied by P. H. Bailhache, Surgeon Marine Hospital Service, and Dr. Lawler, Quarantine Officer, boarded the Government tug-boat at the Clay Street Wharf and steamed around Angel Island to the quarantine station, on the north side of the island, where a landing was made at the wharf.

The Board, after a view of the premises from the wharf, returned to San Francisco and adjourned until 9 A. M. the next day.

J. R. LAINE,
Secretary.

THE STATE BOARD OF HEALTH MET IN REGULAR ADJOURNED SESSION

At the Palace Hotel at 9 A. M., April 22, 1892.

Present—Drs. Cochran, Ruggles, Remondino, Nutting, and Laine.

The President stated that owing to the unexpected detention of the Board at San Francisco, it would be impossible to complete the sanitary survey of State institutions during the present session. Drs. Laine and Ruggles were thereupon instructed to visit Agnews Asylum and the San José Normal School, if possible, before the close of the fiscal year. Dr. Cochran then presented the following communication, which was read by the Secretary:

SAN FRANCISCO, April 22, 1892.

To the members of the State Board of Health:

I desire to present my resignation as President of this Board, to take effect June 30, 1892, next, the close of the fiscal year of the Board.

I ask that my resignation be accepted and my successor elected at this meeting.

There are several reasons why I resign; one of which is, I feel that being President of this Board is a compliment that should be passed around among the members; another is, the distance from Los Angeles to the place of meeting. As long as I am President I feel under the greatest obligation to attend all of the meetings of the Board, and this is at times very inconvenient.

Permit me to express to each member my gratitude and appreciation for the honor you did me in electing me your President; and more especially, for the constant and uniform courtesy at all times extended to me by each one of you.

Very respectfully,

W. G. COCHRAN.

Dr. Ruggles begged Dr. Cochran to withdraw his resignation.

Dr. Cochran replied that he could not consistently do so, inasmuch as there were others who should share the honor of being President of the Board. Upon the urgent request of Dr. Ruggles, the Board refused

to accept Dr. Cochran's resignation, but his communication was ordered spread upon the minutes of the Board.

The Board then adjourned to meet at Los Angeles in May or June, at the call of the President.

J. R. LAINE,
Secretary.

THE STATE BOARD OF HEALTH MET IN REGULAR ADJOURNED SESSION

At 9 A. M., May 16, 1892, at Los Angeles.

Present—Drs. Cochran, Remondino, Ruggles, and Laine.

A letter was read from Dr. Nutting expressing regrets at his compulsory absence.

The Board then decided to make a sanitary survey of the State Reform School at Whittier, and of the State Normal School at Los Angeles.

THE REFORM SCHOOL AT WHITTIER.

This place was found to be admirably situated for the purpose for which it is intended. The grounds are sufficiently elevated to furnish ample fall for the drainage, which is all received in one common receptacle a few hundred feet west of the main building, and strained. The solid matter is utilized on the farm as a fertilizing agent, and the water deprived of its solids is used on the farm for irrigation purposes.

The lavatories and closets were in perfect order, and there was an abundance of excellent water for all necessary purposes. The accommodations for girls were altogether inadequate, but the dormitories for boys were quite sufficient for the number there at the time. They were clean, well aired, and there was sufficient bedding of a good quality.

The food placed on the tables was of good quality, ample in quantity, and well cooked. The supplies found in the store-room were of good quality. The butter and fresh meats were sweet and fresh. The whole place had an air of neatness. The Board were deeply impressed with the observable results of the State's endeavor to care for the youths attending the school. It was at once apparent that the influences bearing upon the boys were in many ways beneficial. Their appearance, instead of being sullen and depressed, was contented and cheerful. Seen at their studies, there was little to distinguish them from classes in boys' schools in other places.

In the paint shop, shoe shop, tailor shop, blacksmith shop, cabinet shop, on the farm, and about the gardens, there was the same cheerful disposition and willingness to perform the duties assigned to each, with little or no obtrusive supervision. The boys seemed to be put on their honor in the matter of behavior and general deportment.

The afternoon drill was performed with an alert precision of movement that would excite the admiration of the most enthusiastic National Guardsman. There was a noticeable absence of any suggestion of a reformatory. No locks or bars; no guards, and none needed. The school needs but the removal of the word "Reform" in its official appellation to make it an ideal as well as a model "State School." It might, with great propriety, be called the "State School," so that when a youth returns to private life he will not be handicapped by the stigma of having been an inmate of a reformatory institution. These youths are

congregated here to be trained into American citizens, and not to be punished for delinquencies, the scope and enormity of which their immaturity does not admit of their comprehending. The offenses for which they are sent to the school are not frequently such as necessarily indicate precocious depravity, but are, with few exceptions, rather evidences of ignorance, parental neglect, and an unrestrained excess of youthful energy.

Keeping the pupils employed, and directing simultaneously the mental, moral, and physical energies, proves to be an effectual and, it is believed, a permanent corrective.

With time fully occupied with study and congenial labor, with plenty to eat, good beds, clean clothes, and frequent baths, life is brightened, with a prospect of an honorable future as intelligent citizens. There is none of the depravity and degradation that follows an association with criminals in houses of correction and penitentiaries.

The Board, therefore, in view of the good to be obtained from such a course, ventures upon the verge of its official province to recommend a careful scrutiny of the methods at Whittier, and their results, in the belief that such observation will not only inure to the benefit of the youths at that school, but that the example may lead to the establishment of another on a similar plan in the interior of the State, and more centrally situated.

It is believed that such a course would prove economical to the State. It certainly would be an enlargement in the humane treatment of unfortunate boys and girls, and would convert them into law-abiding people, when, if left to their deplorable resources, they must inevitably entail a great expense to the commonwealth in their future conviction for crime, and their maintenance as criminals.

The Board adjourned until 9 A. M. the following day.

J. R. LAINE,
Secretary.

THE STATE BOARD OF HEALTH MET IN REGULAR ADJOURNED SESSION

At 9 A. M., May 17, 1892.

Present—Drs. Cochran, Ruggles, Remondino, and Laine.

The Secretary was instructed to supply each member of the Board with the necessary postage and stationery.

The Board appointed Drs. Ruggles and Remondino a committee to inspect the County Hospital at San Diego. A visit was then made to the State Normal School at Los Angeles, where the sanitary condition was found to be unexceptionable.

Before adjourning the Secretary reported having caused to be printed two circulars, in a "Preventive Disease" series, one of which is addressed to the clerical profession, treating on the "Dangers of Public Funerals of those who have died from Contagious and Infectious Diseases," and another addressed to the clerical profession and officers of secret orders and beneficiary societies, on the "Dangers from the Removal of the Hat at Funerals."

The Board then adjourned until the next regular meeting, or to meet at the call of the President.

J. R. LAINE,
Secretary.

REPORT OF THE SECRETARY.

To the State Board of Health:

GENTLEMEN: The system of public hygiene in California, which comes under the police power of the State, is such that the executive administration is everywhere imposed upon the local Boards.

Sanitation, in its modern sense, is, in obedience to natural laws, a product of advanced civilization. Like civilization, it is a development of man's resources, and is, moreover, a true index of his ability to exist. A recognition of the necessity of obedience to rules that by common consent are termed "sanitary" and "hygienic," has led to the enactment of public health laws in all civilized countries. But it was reserved for the present generation to develop it to the prominence which it has now reached. By virtue of social and political organization there becomes vested in every nation, in every State, and, by delegation, to every municipality, a power to defend itself against disorder, indecency, disease, and discomfort. From its very nature such a power is incapable of precise definition or exact limitation. The police power of the State extends to all matters affecting public health and the public morals. It is not restricted to a narrow limit, but extends over a wide domain of social life. It has authority to assert that individual convenience must often yield to public convenience, and that individual profit must often be subordinated to the public good, and individual notions of what is decent and proper shall give way before the general opinion as to what is unbecoming. It emphasizes, in terms that cannot be misunderstood, that all property, of whatever nature, shall only be used by its owner in such a way as not to injure his neighbor. Not only is its exercise to be for the safety of life and property, but also in legislative discretion it must be applied to the proper rules of life, so that the good order, health, and morals of the community may be protected and lifted to a higher plane. So thoroughly is this power of the very essence of all social order, that it cannot be evaded, resigned, or relinquished. The authorities cannot give up definitively this police power. It inheres in the National Government for national purposes, in the State Government for State purposes, and when delegated to county, city, or town, for local purposes.

It might seem that a vigorous exercise of this power might result in an infringement of personal liberty; but the individual liberty which is being evolved in our history, and whose perfection must be the ideal of every lover of humanity, is a harmony between the volition of the intelligent citizen and the needful requirements of organized society. When a law satisfies the educated desires of those who obey it, there can be no infringement of individual liberty. But there are times when the strong arm of force must be invoked for the protection of society. There is sometimes found a vested interest in nuisances. The regulation of the sale of intoxicating liquors, the suppression of gambling, the establishing of quarantines, the isolation of infected persons, the removal of

slaughter-houses from within the limits of towns and cities, the regulation of building so as to conform with plumbing and fire laws, the removal of cemeteries from crowded towns, the construction of sewers and drains for homes at the expense of the owners, are all in the direction of public health and public morals, and should be urged and insisted upon, not only by the citizen, but by public opinion, pulpit, and press, aided by the constabulary force of the State.

LOCAL SANITARY REGULATION.

The larger cities of California have for many years enacted by ordinance laws for the regulation of their local sanitary affairs, aiming to control and prevent the most common and unwholesome nuisances, such as relate to drainage, accumulated filth, and the defilement of water supplies. They have also attempted, with varying success, to make compulsory the notification of infectious and contagious diseases; also, the reporting of births.

The smaller towns, while often manifesting the deepest interest in local affairs, do not frame their ordinances suitable to their local needs, or fail to make them effective by adoption by the Town Trustees or County Supervisors. The communications from correspondents indicate, however, a commendable willingness on the part of citizens generally to aid the Health Officers and Inspectors in every way in their power. Very few recalcitrants have been reported.

Of all the aids to good hygienic results which Boards of Health employ, there is none which exceeds in value that of an efficient Health Officer or Sanitary Inspector. Boards of Health are divided into two classes. The same may be said of nations, political parties, and churches. One will be progressive and active in ferreting out all suggestions of conditions prejudicial to public health. The other will never voluntarily take cognizance of any unsanitary conditions. They feel it their duty to take no action until the danger is brought to their knowledge by a formal complaint of other parties. However dignified this conception of the true functions of a local Board of Health may be, it is far from a conformity with the practical sentiments of the age in which we live.

There have been frequent demands for the "sanitary laws" of the State by the local Boards. The Codes are rarely a part of a physician's library, and the Health Officer or Secretary of a Board often finds it necessary to consult an attorney to ascertain the scope of his duties. The attorney demands a fee. The physician acting as Health Officer is perhaps receiving a nominal salary of \$10 per annum for services which under other circumstances he would not perform at any price. The Trustees will not pay the lawyer, so the Secretary of the State Board is appealed to. He can only inform his correspondent as to the page and section of the Codes or Statutes that relate to his duties as to the subject-matter, but rarely takes the time to write out the sections of the Codes.

In view of the urgent demands for the State laws on sanitary matters, by the correspondents of the State Board, it is deemed expedient to cause them to be printed as a part of this Biennial Report. While it will not be as interesting reading to many as papers and reports on sanitary subjects, yet it is believed that the publication of the laws relating to

public health will be more conducive to the organization and perfection of the health machinery of the State than the publication of any ordinary treatise.

There is in course of preparation a code of sanitary regulations to be issued by the Board, which will be for the instruction of local Boards. It is intended merely as a suggestive Code or outline for their requirements, to be used as a basis for their official action in framing their ordinances.

There is a singular difference in localities and communities with reference to their estimate of any kind of sanitary regulation. Take Redwood City, the county seat of San Mateo County, for example. Redwood City has about two thousand five hundred people, yet it has no Board of Health, and the District Attorney, though an estimable man and an able lawyer, is appointed Health Officer. When urged to send his monthly mortality report before the 10th of each month, he replied that he did not get them in time to enable him to do so; and Redwood City is excluded from the monthly reports of the State Board, because the lawyer Health Officer will not do what the medical Health Officer does—go to the undertakers and Superintendents of cemeteries and make up his report. Redwood City has the usual average of diseases and deaths as shown by the quarterly reports of the County Recorder, so that unusual salubrity of location cannot be advanced as an excuse for not having a Board of Health. It is mentioned merely as an example of unprogressive spirit, shiftlessness, and sanitary unthrift.

MORTUARY STATISTICS.

[For the fiscal year from June 30, 1890, to June 30, 1891.]

In making up the mortuary report for the fiscal year from June 30, 1890, to June 30, 1891, no record of the deaths that occurred during the month of March is included. It has since been found impossible to obtain the data necessary to make up the statistics of that month, which preceded the incumbency of the present Secretary.

The total number of deaths from all causes during the year was 12,820. Estimating the population of California to be 1,250,000, it would make the death rate 12.24 per thousand of the population.

Smallpox.

There were but 4 deaths from smallpox during the year. This disease prevailed to a moderate extent in remote portions of the State, but in every instance it was easily controlled and finally stamped out.

Measles.

There were but 26 deaths due to measles, 8 having occurred in May, 1891, and 5 in June of the same year. The preceding January of the same year claimed 5 deaths from the same cause.

[Scarlatina.]

There were 39 deaths due to scarlatina during the year, May, 1891, having furnished 9 of the deaths. The remaining deaths were distributed quite evenly throughout the year.

Diphtheria.

There were 488 deaths due to diphtheria, without estimating what occurred in March. As there were 60 deaths in February, and 56 deaths in April, it is fair to presume that there were 50 during the month of March. Adding this number to 488 makes a total of 538 for the year. This would correspond to 4.30 per thousand of population.

Influenza.

Influenza is credited with 50 deaths during the year, the fatality having begun in November. In December, 1890, there were 2 deaths; in January, 1891, there was 1; in February, 1891, there were 8; in April, 17; in May, 13; and in June, there were 7.

Whooping-Cough.

Whooping-cough caused 35 deaths during the year, 17 of which occurred in May during the prevalence of la grippe.

Typhoid Fever.

There were 334 deaths due to typhoid fever; 47 of these are classed on the table under the head of typho-malarial fevers. As the term "typho-malarial" would indicate the specific infection of typhoid fever, it must to all intents and purposes be considered identical with that disease. Inasmuch as the malarial complication is susceptible to remedy, while typhoid is not, it should be classed as typhoid. Its prevalence was quite evenly distributed throughout the year.

Cerebro-Spinal Fever.

Cerebro-spinal fever caused 73 deaths.

Respiratory Diseases.

There were 1,818 deaths due to consumption. Pneumonia caused 1,135. Pleurisy, 29. Bronchitis, 323. Other diseases of the respiratory organs caused 187 deaths.

This would show 3,492 deaths from chronic and acute respiratory diseases during the year. The greatest fatality was from November, 1890, to June, 1891.

Alcoholism.

One hundred and twenty-one deaths are credited to alcoholism, direct or remote, including delirium tremens.

MORTUARY STATISTICS.

[For the fiscal year from June 30, 1891, to June 30, 1892.]

The total number of deaths from all causes during the year were 15,847, making a death rate of 12.67 per thousand, estimating the population at 1,250,000.

Smallpox.

There were no deaths reported from smallpox during the entire year. Very few cases were reported to have prevailed except at the quarantine station on Angel Island, in San Francisco harbor, where it was so completely controlled as to be effectually stamped out.

Measles.

Deaths from measles numbered 84, distributed quite evenly throughout the year, is the sum of fatalities from that disease.

Scarlatina.

There were 103 deaths reported from scarlatina, the greatest fatalities beginning in December, 1891, when there were 15 deaths. There were also 15 deaths in January, 1892; 14 in February; 6 in March; 15 in April, and 14 in May.

Diphtheria.

This disease, as usual, shows a frightful mortality of 484, to which might be added 185 from croup, which makes 669 deaths due to this terrible disease. The fatalities during the different months of the year have varied so little that it is unnecessary to specify them, especially as a glance at the mortuary tables herewith appended will supply the information.

Epidemic Influenza—La Grippe.

During the year there were 223 deaths attributed directly to la grippe. Five occurred in July; 2 in August; 3 in September; 2 in October; 4 in November; 51 in December, 1891; 107 in January; 27 in February; 13 in March; 5 in April; 3 in May, and 1 in June, 1892.

California was visited by an epidemic of influenza during the winter of 1890-91, lasting until the following June. Its onset was simultaneous with reports of the disease in remote parts of the continent. There is reason to believe that it affected those where it could not have been conveyed by travel or other means of conveying the ordinary forms of contagious diseases. It prevailed in the Sacramento and San Joaquin Valleys, the foothill counties at an elevation of from one to four thousand feet, the vicinity of Truckee at an elevation of six thousand feet, and the foggy seacoast at the same time and in precisely the same manner. The dry region of the Colorado Desert at Needles enjoyed no immunity; in fact, suffered more in proportion to numbers than the cities and towns of Southern California.

There was another visitation during last winter, very much intensified, but in the main presenting the same characteristics with corresponding complications and sequelæ. Many who had the disease the first winter were again attacked, and others were afflicted with two and three attacks during the second winter. But few deaths were credited to it directly during the first winter; but during the second, when a familiarity with its clinical features had been very generally established, many deaths were reported, not only from the immediate effects of the epidemic, but more from its results and sequels.

This was especially observable in a great increase of diseases of the lungs, notably pneumonia and bronchitis.

As might be expected, the weak and sickly when attacked were the first to succumb; but these were not among the first to take the disease, and while not enjoying an immunity from it, showed no more susceptibility than the robust. The first to show its influence were those habitually exposed to out-door life. All observers agree that when one case appeared in a house nearly every member of the household had it thereafter. Those afflicted with phthisis-pulmonaris were affected in a marked degree when attacked, but it showed no marked predilection for this class, and many pronounced consumptives made good recoveries from la grippe, without showing any deviation in the course of the original disease. No attempt will be made to give the number of fatalities of the epidemic of the last two years. A perusal of the subjoined monthly circular of the State Board of Health will give a general idea of the deaths due to the immediate effects of the malady, and the more remote effects, which it has become the custom among insurance companies to sum up as "results of la grippe." These results have been of a Protean character in California. Pneumonia, bronchitis, catarrhal pneumonia, coryza, with depression and great anxiety, severe cough, dyspnœa, extreme soreness in the chest, pain in the back and limbs, stitches in the side, headache, diarrhœa, tonsilitis, pharyngitis, earache, dizziness, and mild delirium were some of the effects of the seizures. A proneness to pneumonia, with a tendency to relapse, was the condition of most patients after an attack. The strong and robust showed no exception to this tendency.

All were left with a sense of depression and lessened vitality. The force of the seizure was spent, in many cases, on the nervous system. Many of this class of cases have not yet recovered, but have progressively declined, losing flesh, and presenting the general symptoms of breaking down of the constitution.

It follows that a disease affecting so profoundly not only the nervous system, but nearly all the organs in the body separately or generally, as a catarrhal fever, must of necessity produce a violent shock on the great number of people who are always living on the brink of the grave, whose diseased hearts or brains, or lungs, or shattered nervous systems, or diseased kidneys have placed them in such a condition that the perturbing influence and sharp fever of la grippe is sufficient to make them easy victims. The same may be said of all epidemics. If a man afflicted with chronic nephritis takes la grippe, and dies during any of its complications, la grippe will be accredited with the cause, and not Bright's disease.

It is not intended to give the history of former epidemics of this disease, nor to descant on its clinical history and exciting cause. These have been pretty generally gone over during the two years that this unwelcome guest has been among us. It will be seen from the above that there has been a sameness of symptoms and general history with all accounts of its manifestations in other countries and other States. To present an opportunity of comparing the prominent features of general symptoms is all that this is intended to comprehend.

The facts in reference to the spread of epidemics of influenza, and the course of the disease in infected localities, are comprehensible upon no other theory than that of a specific infecting principle as its exciting cause. That this principle is carried over vast expanses in an incredible short space of time, producing its specific effects which we call

influenza or la grippe, over vast areas of land and sea without communication from man to man, is believed to be fully established. That when one person in a household is affected with it the infection is sufficient to produce the disease in the others, is accepted by many, and general observation tends in that direction. The medium of its communication is the atmosphere, and if a germ, it must possess the power of reproducing itself in that medium; otherwise, it would become lost by dispersion in traversing distances measured by oceans and continents.

Whooping-Cough.

Whooping-cough is credited with 94 deaths, being nearly three times the number during the previous year. This must be attributed, to a considerable extent, to prevalence of la grippe, which would necessarily increase the fatality of this disease.

Typhoid Fever.

There were 340 deaths from typhoid fever, to which must be added 22 which appear on the tables attributed to typho-malarial fever, making a total of 362 deaths from this cause. Like the preceding year, these fatalities were quite evenly distributed throughout the twelve months.

Cerebro-Spinal Fever.

There were 74 deaths from cerebro-spinal fever during the year, being one more than during the preceding year.

Pulmonary Consumption.

This disease, as usual, takes the lead in the cause of fatality, and heads the list with 2,304 deaths, being a considerable increase over the previous year, when there were 1,818 deaths. A glance at the tables will show that the highest mortality occurred during the height of the epidemic of la grippe.

Pneumonia.

There were 1,415 deaths from pneumonia, as against 1,135 during the previous year. Here again a glance at the tables will indicate that the highest number of fatalities occurred during the month when the highest number of fatalities from la grippe occurred, the disease having jumped from 94 in November to 315 in January.

A corresponding increase is shown in bronchitis and congestion of the lungs. Those months which show the largest number of deaths from la grippe show the largest number of deaths from chronic and acute pulmonary diseases.

Pleurisy.

Pleurisy is credited with but 24 deaths.

Bronchitis.

There were 461 deaths credited to bronchitis, and 139 to congestion of the lungs, while 164 deaths come under the head of other diseases of the respiratory organs. This would show chronic and acute diseases

of the respiratory organs to have caused 4,343 deaths during the fiscal year, which is an increase over the former year of 851.

Alcoholism.

Alcoholism, directly or remote, including delirium tremens, is credited with 192 deaths.

J. R. LAINE, M.D.,
Secretary State Board of Health.

MONTHLY REVIEW OF DEATHS AND PREVAILING DISEASES.

Reported to the State Board of Health from July, 1890, to July, 1892.

[Reprinted from monthly circular of State Board of Health.]

JULY, 1890.

Mortality reports received from 104 cities and towns throughout the State, containing an estimated population of 850,440, give the number of decedents as 1,132, which is a monthly percentage of 1.33 per 1,000, or an annual mortality of 15.96, which is an increased death rate over that of last month. This may in a great measure be attributed to the increased mortality from stomach and bowel disorders, especially cholera infantum among children. We find that the increased temperature during the month was a prominent factor in the causation of these diseases, and no doubt contributed greatly to their fatality.

CONSUMPTION caused nearly as large a mortality as last month, 150 deaths being attributed to it.

PNEUMONIA seemed to be favorably influenced by the warm weather, there being but 50 deaths recorded from it. Of these 34 occurred in San Francisco, the remainder in isolated cases throughout the State.

BRONCHITIS.—Twenty-one cases died from this disease, which is a marked decrease from last report.

CONGESTION OF THE LUNGS was reported fatal in 12 instances.

WHOOPIING-COUGH caused 3 deaths.

DIPHTHERIA AND CROUP, collectively, were the cause of 24 deaths, which is a large decrease from the number reported last month. Of the 17 caused by diphtheria, 10 occurred in San Francisco, 3 in Sacramento, 2 in Los Angeles, and 1 each in Haywards and Anaheim.

CHOLERA INFANTUM is reported to have caused 82 deaths, which is the largest mortality in any one month this year. The deaths from this cause in June numbered 51 and in May only 6, showing conclusively how much the disorder is influenced by increased temperature.

DIARRHŒA AND DYSENTERY caused 31 deaths, which is a very marked increase indeed, nearly double the mortality of the preceding month.

SCARLET FEVER was fatal in 2 instances, one of which occurred in San Francisco and 1 in Sacramento.

MEASLES was fatal in 3 instances, 1 in San Francisco, 1 in Downey, and 1 in Los Angeles.

TYPHO-MALARIAL FEVER is credited with causing 1 death in Mendocino.

TYPHOID FEVER is reported to have caused, last month, 32 deaths, which is almost double the mortality in June from this cause, and indicates a laxity of hygienic care in the cleansing of our dwellings, or in the preparation of our food and drink.

REMITTENT FEVER caused 10 deaths, which is also a marked increase over last report.

CEREBRO-SPINAL FEVER was credited with 12 deaths, which is a decrease of nearly one half from last month's report; 8 of these deaths occurred in San Francisco, 2 in Watsonville, 1 in Alameda, and 1 in Jolon.

ERYSIPELAS caused no fatality during the month.

CANCER was fatal in 37 instances.

HEART DISEASE caused 75 deaths.

ALCOHOLISM proved fatal in 10 instances.

DEATHS FROM CAUSES not classified in this abstract numbered 499.

PREVAILING DISEASES.

Reports of diseases received from over 100 towns agree in general that the amount of sickness is limited in nearly every locality; no epidemic is prevailing in any part of the State, if we except, perhaps, measles and whooping-cough, which in a few towns prevail extensively. The many warm days that occurred in July produced, with other factors, a decided increase in stomach and bowel disorders, which in some cases were so severe as to warrant the name of cholera morbus. This severe form of vomiting and purging was noticed as—

CHOLERA MORBUS in Tehachapi, where it was quite prevalent; it was also noted in Williams, Fresno, Downey, Lodi, Pleasanton, Merced, and Sacramento.

DIARRHŒA AND DYSENTERY were observed with frequency in Oakland, San Francisco, Los Angeles, Chico, Alameda, Rio Vista, Gridley, Anaheim, Williams, Redding, Tehachapi,

Middletown, Truckee, Fresno, Downey, Bakersfield, Sausalito, Needles, Lakeport, Etna Mills, Lockeford, Stockton, Hollister, Sacramento, Ione, Calico, Oakdale, El Monte, New-man, San José, and Benicia.

CHOLERA INFANTUM is mentioned as present in a great number of places. In San Francisco it was quite prevalent; it was also noted in Oakland, Haywards, Alameda, Dixon, Davisville, Sacramento, Chico, Grass Valley, Ione, Los Gatos, Merced, Napa, Petaluma, Pleasanton, Rio Vista, Pomona, San José, Stockton, Vallejo, Gridley, Fresno, Gonzales, Jackson, St. Helena, and Cottonwood.

MEASLES was reported in Sacramento, where it is becoming quite prevalent. It also was noted in Middletown, Downey, Jolon, Sausalito, North San Juan, Hollister, Merced, St. Helena, Los Angeles, and San Francisco.

SCARLET FEVER.—A few cases were reported in Sacramento, San Francisco, Rocklin, Ontario, St. Helena, and Sausalito.

SMALLPOX was reported in North San Juan, but inquiry from Dr. George Farley, our Health Officer, elicited the fact that the report was a mistake, and without any foundation in truth.

DIPHTHERIA AND CROUP.—Some sporadic cases of these diseases were reported in San Francisco, Sacramento, Rio Vista, Anaheim, Tehachapi, Truckee, Cloverdale, Downey, Elk Grove, Etna Mills, Haywards, Los Angeles, and Oakland.

WHOOPING-COUGH was noted in Sacramento, San Francisco, Merced, Williams, Truckee, Hanford, Ontario, Bakersfield, Lodi, Etna Mills, and North San Juan.

ERYSIPELAS.—Some cases of this disease were reported in Cottonwood, Knights Ferry, Fresno, Elk Grove, Bakersfield, Lodi, Eureka, Calico, Ione, and Merced.

TYPHOID FEVER is noted with increasing frequency in our sickness reports. Cases occurred during the month in Igo, Tehachapi, Fresno, Bakersfield, Needles, Lodi, Etna Mills, Eureka, Elsinore, Merced, El Monte, St. Helena, Sacramento, Angels Camp, Los Gatos, Healdsburg, Mendocino, Oakland, Vacaville, San Mateo, Rocklin, and San Francisco.

TYPHO-MALARIAL FEVER was observed in Livermore, Truckee, Hanford, Colfax, and Pleasanton.

REMITTENT AND INTERMITTENT FEVERS are noted in nearly all of our reports, as might be anticipated at this season of the year.

PNEUMONIA is mentioned in a decreasing number of our reports. Sporadic cases were noted in Sacramento, Igo, Jolon, Ione, Alameda, Angels Camp, Berkeley, Eureka, Folsom, Grass Valley, Los Angeles, Petaluma, Oakland, San Benito, Trinity, and San Francisco.

BRONCHITIS was somewhat prevalent in a mild form. It was noted in Igo, Rio Vista, Tehachapi, Downieville, Truckee, Fresno, Galt, Pleasanton, St. Helena, El Monte, Los Angeles, Pasadena, San José, Santa Barbara, and San Francisco.

CHOLERA ASIATICA.—This dread disease shows no sign of abatement in Spain; on the contrary, it is spreading rapidly through the provinces. We are, however, more concerned nearer home, the disease having made its appearance in Japan, to which we are so closely allied by commerce and individual intercourse. The disease having been so clearly proven to be contagious through excretions from the infected body, the utmost vigilance will have to be exercised to prevent the transportation of these poison germs to our shores. But suppose all vigilance fails, and cholera suddenly appears in our midst. The question that should present itself to every community in the State at this moment is: Are we prepared to repel the invader; are our cities, towns, hamlets, and individual premises in such a state of order and cleanliness that disease can find no accumulated filth in which to incubate its germs? If they are, we have nothing to fear, as it has been stated by good authority that the cholera germ is innocuous when it leaves the human organism, and that it requires another medium outside of man to mature and complete its infective properties. That medium is a soil moist and saturated with impurities. If this assertion is true, it necessarily follows that the most complete safeguards against the spread of cholera are a clean soil, untainted air, and pure water. The first may be attained by proper drainage, removal of superincumbent filth, garbage, and all accumulations of dirt within or near our dwelling places. Health Boards and Health Officers should now be more vigilant than ever, and enforce, with all the power the law gives them, the proper cleansing of the districts under their charge. They are the officers accountable to the people for the preservation of their lives when threatened by disease; their responsibility is great, and their remuneration should be adequate. We know that cholera cannot exist or extend when the means of its existence are destroyed. To do this is the work of local Boards of Health and Health Officers. No favoritism or dislike to prosecute offenders in the enforcement of the provision of the law should, for a moment, influence the health authorities when a great danger like the present menaces the community. It can be averted by every Sanitary Board and every Sanitary Officer doing their whole duty conscientiously, without fear or favor; whereas, putting off to a more convenient season that which should be done to-day, may be followed by an epidemic of one of the most fatal of diseases, the end of which no man can foretell or its results foresee.

PACIFIC COAST WEATHER SUMMARY.

During the month of July the weather in the Pacific Coast States has not been characterized by unusual conditions. The rainfall has been below the normal at all stations except San Francisco, where the increase amounts to .02 of an inch. The deficiency

ranged from "trace," at Red Bluff and Los Angeles, Cal., to .74 of an inch at Spokane Falls, Washington. No rainfall was reported from Southern California during the month. Rain fell on five days at Yuma, but in amounts too small to measure. In Northern California rain fell at San Francisco on the 8th, Eureka on the 8th and 20th, and amounts too small to measure at Keeler on the 20th and 21st. In Oregon the rainfall was confined to the northern portion of the State, and in Washington to the southern and extreme eastern portions. The heaviest monthly rainfall for July (1.64 inches) occurred at Fort Canby, Washington. The heaviest daily rainfall (.54 of an inch) occurred at Fort Canby on the 9th.

The temperature has been above the normal at all stations except Red Bluff, Portland, and Olympia, where it has remained stationary. The increase has varied from about 1° at Fort Canby and Spokane Falls to 9° at Los Angeles.

It is important to note, in connection with these remarks, that the reports from Signal Service stations furnish data from which general estimates of weather conditions are made. Therefore, this review, in its brief summarization of the events of the month, cannot take account of peculiar local effects. Reports from a greater number of stations would necessarily bring to light peculiar circumstances of rainfall and temperature, which are rather to be expected in a region so subject to local peculiarities as the Pacific Coast States.

[illegible]

ABSTRACT FOR JULY, 1890—Continued.

LOCATIONS AND AUTHORITIES.	DISEASES.																							Total Deaths	Estimated Popula- tion
	Other Causes	Alcoholism	Heart Diseases	Erysipelas	Cancer	Cerebro - Spinal Fevers	Remittent and Intermittent Fevers	Typhoid Fever	Typho - Malarial Fever	Whooping-Cough	Smallpox	Measles	Scarlet Fever	Croup	Diphtheria	Other Diseases of St'mach & Bow'ls	Cholera Infantum	Diarrhoea and Dysentery	Congestion of the Lungs	Acute Bronchitis	Acute Pneumonia	Consumption			
San Mateo County, County Recorder	14	0	1	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	18	12,000	
Santa Barbara, Dr. R. F. Winchester	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5,400	
Santa Cruz, Dr. C. L. Anderson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	7,500	
Santa Rosa, Dr. H. C. Crowder	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5,500		
Sausalito, Dr. H. J. Crumpton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	450	
San Benito County, Dr. J. H. Tebbetts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	8,000	
Shasta, Dr. J. M. Briceland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	600	
Sisson, Dr. E. C. Rhodes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1,500	
Siskiyou County, County Recorder	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	4	10,000	
Stockton, Dr. C. A. Ruggles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	14	15,000	
St. Helena, Dr. W. J. G. Dawson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	2,500	
Suisun, Dr. J. W. B. Reynolds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1,000	
Susanville, Dr. A. Milliken	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	850	
Tehachapi, Dr. A. Shafer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500	
Truckee and vicinity, Dr. W. Curless	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1,300	
Trinity County, G. E. Gorman, H. O.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5,000	
Tulare City, Dr. C. F. Taggart	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2,900	
Ukiah, Dr. E. W. King	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3,000	
Vallejo, Dr. W. D. Anderson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	6,000	
Vacaville and Elmira, Dr. J. W. Stitt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4,000	
Visalia, Dr. T. W. Pendergrass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	3,000	
Watsonville, Dr. W. D. Rodgers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7	2,500	
Wheatland, Dr. L. Melton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	900	
Williams, Dr. A. W. Kimball	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	600	
Woodland, Dr. T. Ross	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4,000	
Totals	499	10	75	0	37	12	10	32	1	3	0	3	2	7	17	78	82	31	12	21	50	150	1,132	850,440	

AUGUST, 1890.

Mortality reports received for the month of August from 96 different localities throughout the State, with an estimated population of 806,360, give the number of decedents as 1,065, a monthly percentage of 1.32 per 1,000, or an annual mortality at the rate of 15.84 per 1,000, which is somewhat less than that of the preceding month. The mortality from cholera infantum and stomach and bowel disorders continues without much abatement.

CONSUMPTION caused 157 deaths during the month, which is an increase over last report. PNEUMONIA had only 41 deaths attributed to it, which is a decrease of 10 from last month. Twenty-eight of these occurred in San Francisco, 4 in Oakland, 3 in San José, the balance in single instances scattered here and there.

BRONCHITIS caused 29 deaths; of these 20 occurred in San Francisco, 3 in Los Angeles, 1 each in Vallejo, San José, San Bernardino, Sacramento, Oakland, and Fresno.

CONGESTION OF THE LUNGS was fatal in 11 instances.

WHOOPING-COUGH caused 3 deaths.

DIPHTHERIA AND CROUP, collectively, caused 29 deaths, 25 being from diphtheria and 4 from croup. Of the former, 11 occurred in San Francisco, 2 in Los Angeles, 3 in Alameda, 4 in Sacramento, and 1 each in San José, Oakdale, Pasadena, Cloverdale, and Anaheim.

CHOLERA INFANTUM is reported to have caused 76 deaths in August, which is only 6 less than in the previous month.

DIARRHŒA AND DYSENTERY were fatal in 25 instances, which is a slight decrease from last report.

SCARLET FEVER was fatal in 2 instances, 1 in San Francisco and 1 in Antioch.

MEASLES caused but 1 death, which occurred in Hollister.

SMALLPOX caused no deaths.

TYPHO-MALARIAL FEVER is credited with 5 deaths.

TYPHOID FEVER.—Twenty-eight deaths were reported as caused by this disease, which is a decreased number from the previous month.

REMITTENT FEVER caused 6 deaths.

CEREBRO-SPINAL FEVER is credited with 10 deaths.

ERYSIPELAS caused no fatality during August.

CANCER was fatal in 40 instances.

HEART DISEASE is credited with 63 deaths.

ALCOHOLISM was fatal in 12 cases.

DEATHS FROM CAUSES not classified in this abstract number 451.

PREVAILING DISEASES.

Reports of sickness received from 110 localities throughout the State indicate a very favorable condition of the public health. If we except some bowel disorders that are a very general complaint, we might say that no sickness prevailed to any extent.

CHOLERA INFANTUM was increased in prevalence by the more than average high temperature experienced during the month. It was reported present in Sacramento, Redlands, Fresno, Pleasanton, Middletown, Gridley, Redding, Lockeford, Salinas, Brownsville, Cloverdale, Mariposa, Tulare, Dixon, Cottonwood, Forest Hill, Martinez, Alameda, Berkeley, Grass Valley, Gonzales, Haywards, Oakland, San José, Santa Cruz, Merced, Santa Rosa, Pomona, Orland, and San Francisco.

DIARRHŒA AND DYSENTERY were reported as noticed with increased frequency in Tehachapi, Pleasanton, Middletown, Santa Cruz, San Bernardino, Truckee, Redding, Galt, Hanford, Azusa, Lodi, Lockeford, Lakeport, Susanville, Brownsville, Benicia, Cloverdale, Newman, Williams, Ontario, Fresno, Forest Hill, Calico, Downey, Merced, Anaheim, Chico, Los Angeles, Rio Vista, Oakland, San Diego, Santa Rosa, and San Francisco.

CHOLERA MORBUS.—Some cases of this formidable disease were noticed in Middletown, Pleasanton, Eureka, Lakeport, Anaheim, Cottonwood, Cloverdale, Downey, Williams, Lockeford, Truckee, and Fresno.

MEASLES was reported as quite prevalent in Sacramento; it also was noticed in Pleasanton, Truckee, Dixon, Sausalito, Downey, and Hollister.

SCARLET FEVER.—Some sporadic cases of this disease were reported in Sacramento, Sausalito, Antioch, and San Francisco.

DIPHTHERIA AND CROUP were reported from Sacramento, Truckee, Rocklin, Newcastle, Oakdale, Anaheim, Etna Mills, Tulare, Cloverdale, Elk Grove, Los Angeles, Pasadena, San José, San Francisco, and Alameda. From the latter city Dr. J. T. McLean reports 18 cases, nearly all of whom were attending one of the public schools. He says: "An old cement sewer laid 12 years ago in the block in which this public school is situated, wore out and caved in, thus stopping the flow of sewage from the residences and school in this block. The old sewer was taken up and replaced by a new ironstone one. The process of change from the old to the new sewer occupied a fortnight. During this time sewer gas and disease germs escaped and contaminated the atmosphere in the neighborhood. The school children were more or less exposed, especially those whose curiosity drew them frequently and for a length of time to the vicinity of the sewer. The disease developing in these children, it is believed this broken sewer, with its escaping gas and disease germs, was the exciting cause of this sickness. In one family, where 3 children had diphtheria, 1 of them dying, the plumbing and sewerage were defective, the filth that should go into the sewer escaping into the cellar and contaminating the

atmosphere of the house, from which the sickness and death in this family resulted. Other cases of the disease are of a mild type."

WHOOPING-COUGH was noticed in Truckee, Sacramento, Rocklin, Lodi, Salinas, Etna Mills, Sausalito, and Merced.

ERYSIPELAS, in sporadic form, is mentioned in reports from Truckee, Eureka, Oakdale, Lodi, Anaheim, Mariposa, Susanville, Sausalito, St. Helena, Calico, and Fresno.

TYPHOID FEVER is reported in a very limited number of places in sporadic form, and no doubt arising from local preventable causes: Lockeford, Sacramento, Lodi, Forest Hill, Alturas, Brownsville, Healdsburg, Dixon, St. Helena, Merced, Angels Camp, San Bernardino, Antioch, Chico, Los Angeles, Oakland, San José, Fresno, Santa Ana, Santa Rosa, Stockton, and San Francisco.

TYPHO-MALARIAL FEVER was reported in Truckee, Redding, Galt, Hanford, Oakdale, Anaheim, Knights Ferry, Mariposa, Igo, Susanville, Cottonwood, Merced, Benicia, Yuba City, and Fresno.

REMITTENT FEVER is reported in Tehachapi, where, Dr. Shafer says, it is known as "mountain fever," and then often confounded with typhoid fever. The disease was also present in Anderson, Shasta, Truckee, Gridley, Redding, Newcastle, Needles, Cloverdale, Knights Ferry, Newman, Dixon, and Rocklin.

CEREBRAL FEVER was reported in a limited number of cases in St. Helena, Downey, Santa Cruz, San José, Fresno, San Diego, Galt, and San Francisco.

PNEUMONIA is seldom mentioned in the report for August. Sausalito, Healdsburg, Alameda, Antioch, Chico, Oakland, Petaluma, Sacramento, San Diego, San José, Fresno, and San Francisco report a few cases.

BRONCHITIS was reported in Brownsville, Benicia, Newman, Downey, Tehachapi, Pleasanton, Middletown, Eureka, Galt, Lockeford, Los Angeles, Oakland, Sacramento, Fresno, San José, Vallejo, and San Francisco.

The following is extracted from the Monthly Circular of the Connecticut State Board of Health, as full of interest to California at this season:

SUMMER DIARRHŒA.—A report pregnant with interest at this season of the year has lately been made to the local Government Board of England, relating to the causes of diarrhœa. The investigation of the subject covered a period of 8 years, from 1880 to December, 1888, and an extensive territory, including towns of high and low diarrhœal mortality. It studied carefully the following:

(1) *General Conditions* in their influence as etiological factors, to wit: Temperature of the air—Temperature of the earth to the depth of 4 feet—Rainfall—Air movement.

(2) *Conditions and Locality*, such as—Elevations above sea-level—Soil—Density of population—Impediments to ventilation—Dark and dirty dwellings—Sewer or cesspool emanations—Filthy accumulations of domestic refuse in privies, garbage heaps, etc.—Polluted drinking water.

(3) *Conditions relating to the Population*—As social position—Food and artificial feeding of infants—Maternal neglect and carelessness in infant management. The report gives as the result of this exhaustive study conclusions which the author modestly calls provisional hypothesis. While he accords to a high temperature a very potent influence, he says "it is exerted indirectly," and is not a direct cause of diarrhœa. The following remarkable statement appears in the report: "The summer rise of diarrhœal mortality does not begin until the mean temperature recorded at 4 feet below the earth's surface attains about 56° F., no matter what might have been the previous temperature of the atmosphere or that recorded by the 1-foot earth thermometer." And that the maximum diarrhœal mortality of the year is in the week in which the temperature recorded by the 4-foot earth thermometer attains its mean weekly maximum. And, further, that the decline of the diarrhœal mortality coincides with the decline of temperature recorded by the 4-foot earth thermometer without regard to the atmospheric temperature.

The effect of rainfall seems to depend upon its reducing the earth temperature.

Air Movement.—In diarrhœal season, calm promotes it and high winds lessen it.

Soil.—Diarrhœal mortality is favored by soils permeable to water and air. Rock and impermeable soils lessen it. The presence of organic matter in the soil favors a high diarrhœal mortality.

Density of Population, and everything which contributes to foul the air or interfere with its free circulation, enhances the diarrhœal death rate.

Domestic Darkness and General Dirtiness of Dwellings conduce to diarrhœal mortality; if with these the habitations are crowded and the ventilation bad, then the mortality is highest. *Sewer or cesspool emanations* in a concentrated form and suddenly let loose, the author says, are of themselves capable of occasioning a diarrhœal epidemic.

Food-keeping, exposed in cellars and closets to emanations from domestic filth will produce diarrhœa, especially if stored in dark places and not exposed to currents of air. He sums up the report with the following suggestions: That the essential cause of diarrhœa resides ordinarily in the superficial layers of the earth, where it is intimately associated with the life processes of some micro-organism not yet detected.

That the vital manifestations of such organism are dependent upon conditions of seasons, and on the presence of dead organic matter, which is its pabulum.

That in certain conditions, particularly of temperature, these organisms become volatile, and are wafted through the air, attaching themselves to such organic material as will afford them a nidus and pabulum.

That in food, both in and out of our bodies, such micro-organisms find the proper conditions for their development, multiplication, and evolution.

And that when so received into the human body, they are the material cause of epidemic diarrhoea.

That for obvious reasons bottle-fed babies are most exposed to this infection.

PACIFIC COAST WEATHER SUMMARY.

The month of August has been characterized by a general deficiency of rainfall and a general increase of temperature.

The rainfall has been decidedly above the average in southeastern California, southwestern Nevada, and southern Arizona, where destructive floods, high winds, and thunder storms have occurred. Precipitation has been below the normal at all Signal Service stations except Yuma, Keeler, Fresno, and Spokane Falls. The increase at these stations range from trace at Fresno to 1.61 inches at Keeler. The deficiency ranges from .02 of an inch at San Francisco to .54 of an inch at Portland. Rain fell on 3 days at San Diego, but in amounts too small to measure. The rainfall at Sacramento was a trace, which is the normal condition for the month. Red Bluff was the only station reporting no rain during the month. The heaviest rainfall, 1.71 inches, occurred at Keeler, and a trace at San Diego, Fresno, Sacramento, and San Francisco.

LOCAL STORMS.—On the 5th heavy rains and high winds occurred in southeastern California and southern Arizona. Redlands, California, 2.16 inches; Riverside, California, .55 of an inch; San Bernardino, rain for four hours with heavy thunder storm; Tucson, Arizona, over 60 miles of railroad track washed away. August 6th.—First rain of season in San Diego County; heavy in fruit districts and mountains. At Palmetto, Nevada, 8.60 inches reported as falling in 1 hour, and on the 11th 8.80 inches in about 2 hours, causing great damage to roads. August 10th.—Thunder storm at Topo, San Benito County, California. August 17th.—Thunder storm at Ashland, Oregon, and heavy showers at Shasta, Petaluma, Sonoma, and San Francisco. August 9th.—Los Angeles County, heavy rain, damage to hay and dried fruits.

The temperature has been above the normal at all Signal Service stations. The increase has ranged from 1° at Yuma, to 8° at Los Angeles and Walla Walla. The highest temperature, 110°, occurred at Yuma on the 17th. The lowest temperature, 36°, occurred at Baker City on the 31st.

Abstract of the Reports of Deaths and their Causes in California during August, 1890.

Other Causes	1	6	1	1	1	1	5	0	0	1	0	1	0	1	0	2	0	1	2	0	2	0	2	0	4	0	1	2	1	1	0	1	
Alcoholism	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Heart Diseases	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Erysipelas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Cancer	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Cerebro - Spinal Fevers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Remittent and Intermittent Fevers	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Typhoid Fever	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Typho - Malarial Fever	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Whooping-Cough	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Smallpox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Measles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Scarlet Fever	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Croup	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Diphtheria	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Other Diseases of St'mach & Bow'ls	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Cholera Infantum	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Diarrhoea and Dysentery	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Congestion of the Lungs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Acute Bronchitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Acute Pneumonia	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Consumption	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total Deaths	2	16	3	0	0	3	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Estimated Population	2,250	11,250	2,000	1,500	2,000	5,000	1,000	1,600	1,500	2,800	5,500	600	1,000	2,000	2,000	1,200	1,700	13,000	800	2,500	1,000	2,500	500	500	10,000	500	3,000	4,000	1,500	2,000	6,000		
LOCATIONS AND AUTHORITIES.	Alturas, Dr. J. M. Forrest.	Alameda, Dr. John T. McLean	Anaheim, Dr. J. H. Bullard	Anderson, Dr. O. P. Paulding	Angels Camp, Dr. J. R. Darroh	Antioch, Dr. W. S. George.	Auburn, R. S. Waldo, H. O.	Azusa and vicinity, Dr. J. H. Miller	Benicia, Dr. E. Gray.	Berkeley, Dr. F. H. Payne.	Brownsville, Dr. L. C. Crossman	Calico, Dr. A. R. Rhea	Colton, Dr. M. F. Price	Colusa, Dr. R. A. Gray	Cottonwood, Dr. J. O. Smith	Cloverdale, Dr. R. S. Markell	Chico and vicinity, Dr. W. King	Davisville, Dr. W. E. Bates	Dixon, Dr. A. Trafton.	Downieville, Dr. A. Jump	Downey and vicinity, Dr. J. Q. Rowley	Etna Mills, Dr. E. W. Bathurst	Elk Grove, Dr. J. H. McKee	Eureka, Dr. S. B. Foster	Elsinore, Dr. T. E. Ellis	Forest Hill and vic., Dr. Paul Reudy	Fresno, Dr. T. M. Hayden	Folsom, Dr. B. F. Bates	Galt, Dr. A. Montague	Grass Valley, Dr. W. C. Jones	Gonzales, Dr. C. A. E. Hertel	Gridley, Dr. J. T. Harris	Georgetown, Dr. W. S. Hickman

[illegible]

SEPTEMBER, 1890.

Mortality reports received from 85 different localities throughout the State, with an estimated population of 705,300, give the number of decedents as 920, being a monthly percentage of 1.3 per 1,000, or an annual mortality at the rate of 15.6 per 1,000, which is a considerable decrease from the previous month. The mortality from cholera infantum has in a marked measure decreased, as also have diseases of the respiratory organs.

CONSUMPTION caused 130 deaths in September, which is 27 less than last month.

PNEUMONIA was fatal in 54 instances, which is a slight increase over last report.

BRONCHITIS was credited with only 15 deaths, against 41 for the previous month, which is a decrease of 26 during the month.

CONGESTION OF THE LUNGS was fatal in 16 instances.

WHOOING-COUGH caused but 2 deaths.

DIPHTHERIA AND CROUP, collectively, caused 30 deaths, which is about the same as last month. Nineteen were from diphtheria and 11 from croup. Of those from diphtheria, 8 occurred in San Francisco, 3 in Chico, 2 each in Los Angeles and Haywards, and 1 each in Watsonville, Pasadena, Modesto, and Marysville. From croup, 3 died in Sacramento, 5 in San Francisco, and 1 each in Pasadena, San José, and Grass Valley.

CHOLERA INFANTUM was credited with 45 deaths, which is a decrease of nearly one half the mortality recorded for August. The cooler weather during the month no doubt contributed not a little to this result.

DIARRHŒA AND DYSENTERY were fatal in 24 instances, which is also a decline.

SCARLET FEVER was fatal in but 1 instance, and that in San Francisco.

MEASLES caused but 1 death, which occurred in Los Angeles.

TYPHO-MALARIAL FEVER caused 1 death in Roseville.

TYPHOID FEVER was fatal in 30 cases, which is a small mortality.

REMITTENT FEVER caused 5 deaths.

CEREBRAL FEVER, which includes cerebro-spinal meningitis, is reported to have caused 10 deaths. Of these, 4 occurred in San Francisco, 1 each in Angels Camp, Fresno, Haywards, Pacific Grove, San Diego, and Watsonville.

ERYSIPELAS was fatal in 4 instances during the month; 1 each in Sacramento, San Francisco, San José, and Santa Cruz.

CANCER caused 29 deaths.

HEART DISEASE was fatal in 69 instances.

ALCOHOLISM is credited with 10 deaths during the month.

DEATHS FROM CAUSES not classified in this abstract, 401.

PREVAILING DISEASES.

Reports of sickness from 98 localities throughout the State continue to indicate a very favorable condition of the public health. It does not appear from any of them that epidemic disease of any description is present anywhere in the State. Bowel disorders are quite prevalent, as might be expected at this season, when fruit is indulged in without regard to quantity, and very often to quality. The cooler weather of the month past has had a beneficial effect in lessening the frequency and fatality of summer diarrhœa in children.

CHOLERA INFANTUM was noticed in sporadic form in Pasadena, Salinas, Chico, Gridley, Pleasanton, Knights Ferry, Ione, Lockeford, Mariposa, Angels Camp, Colton, Eureka, Marysville, Nevada City, Oakland, San Francisco, Sacramento, Pacific Grove, Roseville, San José, and Santa Ana.

DIARRHŒA AND DYSENTERY were reported in Azusa, Downey, Needles, Pacific Grove, Downieville, Lodi, Susanville, Brownsville, Lakeport, Chico, College City, Galt, Pleasanton, Hanford, Bakersfield, Fresno, Redding, Williams, Hollister, Julian, Modesto, Los Angeles, Oakland, Sacramento, and San Francisco.

MEASLES is evidently decreasing in the State. A few cases were noticed in Santa Cruz, Rocklin, Hollister, Los Angeles, San Francisco, and Sacramento.

SCARLET FEVER.—A limited number of cases were reported in Sacramento, Santa Cruz, Rocklin, Hollister, and San Francisco. The type is very mild, without any tendency to spread, although given every opportunity to do so. In Sacramento, it has come to our knowledge that children are permitted to attend school while the skin is still desquamating from the children's hands. As this is the most infectious stage, we are surprised at the limitation of the disease. This may be owing to the general good health of the school children, enabling them to resist the attack of the communicable germ; or it may be that the disease has but a weak effective power, and requires some unknown factor to give it that epidemic tendency which makes it one of the most dreadful of the communicable diseases.

DIPHTHERIA AND CROUP were present during the month in Truckee, Chico, San José, Hanford, Sacramento, Knights Ferry, Grass Valley, Haywards, Los Angeles, Marysville, Modesto, Pasadena, and San Francisco. In Chico, Dr. King writes, the disease was chiefly confined to one family, although five other cases appeared subsequently. Strict quarantine, however, prevented any extension of the disease. In Sacramento there was a serious outbreak of diphtheria and diphtheritic croup in the Protestant Orphan Asylum, which was, fortunately, confined to that institution; a few sporadic cases were, however, noted in the city. We cannot too earnestly impress upon the authorities that each case of such disease is a public danger, against which the public, as represented by its local sanitary authorities, is entitled to be warned by proper information, and we

believe that where an institution like the Orphan Asylum is the seat of epidemic contagious disease, it is the duty of the local Sanitary Officer to visit such institution, and have it properly disinfected under his personal supervision. Such disinfection should not be intrusted to those ignorant of the precautionary duties required, or left to the chance of a superficial sprinkling of carbolized water about the room as a sufficient remedy to destroy the germs of the disease. We believe that much of the diphtheria that exists is dependent upon insufficient disinfection where a case occurs. The germ, we know, is most tenacious of life, and except the most skilled disinfection is exercised, will continue to live and propagate its hateful existence for an indefinite period of time. We should therefore require all Health Officers to see to this matter themselves, and know that through their exertions all ordinary precautions have been taken to insure immunity to the public under their charge.

WHOOPIING-COUGH was present in Sacramento, Salinas, Truckee, Anderson, and San Francisco.

ERYSIPELAS is mentioned in reports from Pacific Grove, Chico, Sacramento, Santa Cruz, San José, and San Francisco.

TYPHOID FEVER is reported with increasing frequency as the season advances. Sporadic cases occurred in Salinas, Downey, Needles, Lodi, Chico, Brownsville, Lakeport, Wheatland, Eureka, Igo, Alturas, Ione, Mariposa, Hollister, Stockton, Santa Ana, Santa Barbara, Los Angeles, San Francisco, Sacramento, Oakland, Grass Valley, and Nevada City. The increase in the prevalence of typhoid fever is to be expected at this season of the year, and will continue year after year until the public appreciate the fact that this is a PREVENTABLE disease, and wholly within its own power to eradicate. Its prevention simply requires perfect cleanliness about our persons and premises, and constant watchfulness of the sources of supply of our drinking water. All water from a suspected source should be boiled before using. Numerous instances are recorded where typhoid fever was spread from the rinsing of milk cans with water apparently pure, but really infected with the germs of typhoid fever capable of infecting the milk. We have no doubt that many of the cases of typhoid fever which have baffled our research for their origin have arisen in this way. Most of our dairies have their water supply from wells sunk in the cow yard, where they receive the drainage from the polluted soil. It is a matter of history that cattle themselves suffer from a disease analogous to typhoid fever, if not the identical disease itself. It would, therefore, be an act of prudence on the part of our Health Officers to visit our dairies and examine the source of their water supply, and the means used in keeping the milk from pollution. Milk from an unknown or a suspicious source should be heated to the boiling point before using, as thus is effectually destroyed not only the germs of typhoid fever, but likewise the germs of consumption, which are very commonly conveyed through milk taken from tuberculous cows.

CEREBRAL FEVER was reported in isolated cases in Pacific Grove, Sacramento, Redding, Angels Camp, Fresno, Haywards, San Diego, Watsonville, and San Francisco.

REMITTENT AND INTERMITTENT FEVERS were reported in a good many places, but the type was mild and occurred chiefly along the river bottoms and in the irrigated districts, in preference to other localities.

PNEUMONIA is again becoming frequent in our reports. It was present in Salinas, Santa Cruz, Truckee, San Francisco, Sacramento, Chico, Eureka, Ione, Fresno, Folsom, Haywards, Sisson, Los Angeles, Monterey, Mendocino, Oakland, Petaluma, San Diego, and Gonzales.

BRONCHITIS was quite prevalent in many localities. It was noticed in Downey, Truckee, Needles, Brownsville, Chico, Galt, Pleasanton, Eureka, Bakersfield, Igo, Williams, Mariposa, and San Francisco. The type was mild, and the fatality quite limited.

PACIFIC COAST WEATHER SUMMARY.

The month of September has been characterized by a general increase of temperature, with an excess of rainfall in the south and a deficiency in the north.

RAINFALL.—It has been above the average in southeastern Oregon, California, western Nevada, and western Arizona, being especially marked in the Sacramento and San Joaquin Valleys. It has been below the average in western Oregon and Washington. The excess ranges from .09 of an inch at Los Angeles to 1.18 inches at Fresno. The deficiency ranges from .32 of an inch at Roseburg to 3.03 inches at Fort Canby. Rain fell on the following dates in Washington: 1st, 2d, 5th, 6th, 11th, 14th to 17th, 19th, 30th. Oregon: 1st, 16th, 19th, 23d, 26th, 29th, 30th. California: 4th, 5th, 15th, 16th, 18th, 19th, 22d to 30th. Nevada: 24th to 30th. Arizona: 1st, 3d to 8th, 10th, 15th to 19th, 23d, 24th, 28th, 30th. The following are the heaviest rainfalls for the month: Cisco, 3.13 inches; Colfax, 3.05 inches; Auburn, 2.77 inches; Red Bluff, 1.50 inches; Fresno, 1.30 inches. All stations have reported more or less rain during the month. The period of greatest rainfall was from the 27th to the 30th. It began in Southern California on the afternoon of the 27th, owing to the southwestward movement of a large area of cold air from Utah and Nevada, which had gradually moved southward from Montana on the 25th and 26th. This office issued rain forecasts for Southern California at 6 p. m. of the 25th, 48 hours in advance of the storm. Northern California also received rain forecasts equally far in advance of the storm. On the evening of the 27th, and also on the morning of the 28th, special rain warnings were telegraphed to all parts of California and portions of western Nevada. In spite of the general character of the rain and excessive amounts in certain localities, the damage to crops is reported to be comparatively small.

LOCAL STORMS.—Thunder storms occurred on the 2d at Spokane Falls; 5th, Susanville; 16th, Hollister; 23d, Phoenix; 24th, Fresno and San Miguel; 25th, Porterville. Hail storms occurred at Spokane Falls, 2d; Tombstone, 14th and 23d.

TEMPERATURE.—It has been above the normal at all Signal Service stations except Keeler, Fresno, Eureka, and Fort Canby, where the deficiency has ranged from 1° to 3°. The increase has ranged from 2° at Olympia to 8° at Walla Walla, and 9° at Los Angeles and Yuma. The highest temperature, 110°, occurred at Yuma, on the 3d and 4th. The lowest temperature, 24°, occurred at Baker City, on the 7th and 12th.

FROST.—It occurred at Baker City on the 1st, Newark and Winnemucca on the 2d, Baker City on the 3d, Drain, Or., on the 5th, Winnemucca on the 9th.

[illegible]

ABSTRACT FOR SEPTEMBER, 1890—Continued.

Other Causes	3	4	2	0	2	1	1	1	0	0	0	0	0	0	401
Alcoholism	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Heart Diseases	1	0	0	0	0	0	1	0	0	0	0	0	0	0	69
Erysipelas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Cancer	1	0	0	0	0	0	0	0	0	0	0	0	0	0	29
Cerebro - Spinal Fevers	0	0	0	0	0	0	0	0	1	0	0	0	0	0	10
Remittent and Intermittent Fevers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Typhoid Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30
Typho - Malarial Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Whooping-Cough	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Smallpox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Measles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Scarlet Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Croup	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
Other Diseases of St'mach & Bow'ls	0	0	0	0	0	1	0	0	0	0	0	0	0	0	43
Cholera Infantum	0	0	0	0	0	0	1	0	0	0	0	0	1	0	45
Diarrhoea and Dysentery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
Congestion of the Lungs	0	0	0	0	0	1	0	0	0	0	0	0	0	0	16
Acute Bronchitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
Acute Pneumonia	0	0	0	1	0	0	0	0	0	0	0	0	0	0	54
Consumption	2	0	0	0	1	0	0	0	0	0	0	0	0	0	130
Total Deaths	7	4	3	3	5	3	2	0	0	1	0	0	0	0	920
Estimated Population	2,800	850	1,300	5,000	6,000	4,500	2,500	900	600	4,000					705,309
LOCATIONS AND AUTHORITIES.	St. Helena and vic., Dr. W. J. G. Dawson	Susanville, Dr. A. Milliken	Truckee and vicinity, Dr. W. Curless	Trinity County, G. E. Norman, H. O.	Vallejo, Dr. W. D. Anderson	Vacaville and Elmira, Dr. J. W. Stitt	Watsonville, Dr. W. D. Rodgers	Wheatland, Dr. L. Melton	Williams, Dr. A. W. Kimball	Woodland, Dr. T. Ross	Totals				

OCTOBER, 1890.

Mortality reports received from 80 different localities throughout the State, with an estimated population of 754,639, give the number of decedents as 1,016, being a monthly percentage of 1.34 per 1,000, or an annual mortality of 16.08 per 1,000, which is an increase over that of the previous month.

CONSUMPTION is credited with 150 deaths, which is an increase of 20 over the death rate in September.

PNEUMONIA caused 56 deaths, which is also an increase over last report.

BRONCHITIS was fatal in 20 instances.

CONGESTION OF THE LUNGS caused 7 deaths.

WHOOPING-COUGH caused 4 deaths.

DIPHTHERIA is credited with 39 deaths, which is a large increase over the mortality caused by this disease last month. Twenty of these deaths occurred in San Francisco, where the disease is quite prevalent, 4 in Los Angeles, 3 in Alameda, 3 in Sacramento, 2 in Sausalito, and 1 each in San José, Visalia, Grass Valley, Fresno, Chico, Napa, and Newcastle.

CROUP caused 18 deaths, which is a large increase over the deaths from it last month. Thirteen died in San Francisco, 2 in Santa Ana, and 1 each in Stockton, San José, and Sacramento.

CHOLERA INFANTUM is credited with 32 deaths, which is a decrease from last report.

DIARRHŒA AND DYSENTERY were fatal in 13 instances.

SCARLET FEVER caused 1 death, which occurred in Oakland.

MEASLES was fatal in 2 instances, 1 in Sacramento, and 1 in Shasta.

TYPHO-MALARIAL FEVER, although quite prevalent, caused but 3 deaths.

TYPHOID FEVER is credited with 36 deaths, which is an increase over the number reported last month.

REMITTENT FEVER is credited with 5 deaths.

CEREBRO-SPINAL FEVER is reported to have caused 5 deaths.

ERYSIPELAS was fatal in 2 instances.

CANCER caused 29 deaths, which is about the monthly average.

HEART DISEASE caused 89 deaths.

ALCOHOLISM is credited with 15 deaths during the month.

DEATHS FROM CAUSES not classified in this abstract, 428.

PREVAILING DISEASES.

Reports received from 86 localities in different parts of the State indicate an increase of sickness in most of them, especially in those diseases affecting the respiratory system. This might have been expected, as these diseases are greatly influenced by the mean temperature. They increase in prevalence as the temperature falls, and diminish as it rises. During the month of October the temperature was generally higher than normal during the earlier part of the month, but later there was a rapid fall, in some places so marked as to produce frost. This change seemed at once to determine an increase of pneumonia, bronchitis, and a condition of pulmonary affection approximating very closely to "la grippe," without inducing the severe debilitating effect coincident with that disease. It was also observed that the change in temperature had given a temporary prevalence to bowel disorders in those persons whose excretory functions were particularly active and easily influenced by variations in temperature.

CHOLERA INFANTUM, which, at this season of the year, usually diminishes in frequency, was noticed as prevailing in many places. Sporadic cases occurred in Sacramento, Cloverdale, Gridley, Lodi, Redding, Middletown, Oakland, Haywards, Alameda, San José, San Francisco, Downey, Fresno, Berkeley, and Grass Valley.

DIARRHŒA AND DYSENTERY were reported in Hanford, El Monte, Hopland, Lodi, Redding, Eureka, Gridley, Visalia, Truckee, Galt, Sacramento, Hollister, Shasta, Downey, Fresno, College City, Chico, Los Angeles, San Diego, and San Francisco.

MEASLES is prevailing in some few places—Sacramento, Elk Grove, Igo, Monterey, and Rocklin.

SCARLET FEVER.—Sporadic cases of this disease were observed in Sacramento, San Francisco, Oakland, Hollister, Pacific Grove, and Truckee.

WHOOPING-COUGH was reported in San Francisco, Oakland, Lockeford, Truckee, and Sacramento.

ERYSIPELAS.—Sporadic cases of this disease were reported in Truckee, Fresno, College City, and San Francisco.

TYPHOID FEVER.—The reports of this disease are increasing, the continued dryness of the weather being very favorable for its development. Sporadic cases were reported in Cloverdale, Cedarville, Napa, Lodi, Truckee, Galt, Igo, Elk Grove, Soquel, Nevada City, St. Helena, Oakland, Calico, Downey, Alameda, Oakland, San Francisco, San José, and Santa Ana.

TYPHO-MALARIAL FEVER was reported to be present in Hanford, Hopland, Cloverdale, Redding, Visalia, Cottonwood, Biggs, Hollister, Fresno, and College City.

REMITTENT AND INTERMITTENT FEVERS are not prevailing to any extent. Some few cases were observed in Gridley, Visalia, Knights Ferry, Redding, Truckee, Cottonwood, Fresno, Pacific Grove, Dixon, Anderson, Calico, Lockeford, Igo, Galt, and Marysville.

CEREBRAL FEVER was reported in isolated cases in Redding, Fresno, Grass Valley, and Pasadena.

PNEUMONIA was quite prevalent during the latter part of the month. It was so reported in San Francisco, Oakland, Alameda, Sacramento, Hanford, El Monte, Cottonwood, Lakeport, San José, St. Helena, Anderson, Gonzales, Fresno, Los Angeles, and Santa Barbara.

BRONCHITIS prevailed very generally, and was reported in College City, Fresno, Downey, St. Helena, Middletown, Lakeport, Lockeford, Galt, Visalia, Eureka, El Monte, Salinas, Los Angeles, and San Francisco.

INFLUENZA was mentioned in nearly all our reports as having been observed during the latter part of the month, some of our correspondents being of the opinion that it was a prelude to la grippe of last winter.

DIPHTHERIA AND CROUP have been quite prevalent during the month, assuming a malignity in many cases that has been quite unusual hitherto. In view of this prevalence, the State Board of Health has deemed it advisable to publish, for gratuitous distribution, a small pamphlet on the disease, its restriction and prevention, which can be had on application to the Secretary at Sacramento. The conditions being favorable for the development of the disease, the local health authorities should look more strictly to the public safety than they apparently do in the presence of these cases of diphtheria. They have the power of requiring from those persons attacked, that in regard to residence and otherwise, they shall so conduct themselves as not unnecessarily to multiply the chances of extending the affection to others. Public funerals should be strictly forbidden, and the transportation by rail of those dead from diphtheria should not be allowed, except under the most stringent provisions and competent inspection. Each case of such disease is a public danger against which the public is entitled to be warned by proper information. Any person knowingly having this disease under his care or control, who voluntarily neglects to take all the necessary precautions to prevent its spread, should not only be punishable by penalty, as for an act of nuisance, but should be liable to pay pecuniary damages for whatever harm he may occasion to others. At this time it would be well for parents to keep a watchful eye upon the animals with which their children play, as it is a well-ascertained fact that dogs and cats are very frequent carriers of infection into a household. An instance occurred in this city where a pet cat contracted diphtheria from a sick child and conveyed it to a neighbor's child who unfortunately played with it just after it had left the infected home. Cats having diphtheria generally display it by a yellow discharge through the nose, a gummy secretion about the eyes, a hoarse voice, and a desire for quiet and seclusion. Dogs are not nearly so subject to diphtheria as cats, but are liable to carry the infection on their hair. A curious fact recently discovered by Dr. Klein, and confirmed by the Health Officers in London, is that cats suffering from diphtheria manifest the disease more frequently in inflammatory deposit in the lungs than elsewhere, and while in this condition they were capable of communicating the disease to children, as when it manifested itself in the throat and nose. In San Francisco the disease is reported as almost epidemic, and ascribed to emanations proceeding from filthy sewers. It was also quite prevalent in Sacramento, in the vicinity of the drainage canal; was reported in Visalia, Napa, Sausalito, Hopland, Lodi, Eureka, Truckee, San José, St. Helena, Los Angeles, Downey, Fresno, Newcastle, Grass Valley, Chico, and Alameda. The extension of this disease to so many parts of the State may, perhaps, be attributed to some condition in the atmosphere of which we are ignorant, but we do know that wherever the germ is deposited, it is nurtured in filth and developed where sanitation is deficient.

PACIFIC COAST WEATHER SUMMARY.

The most striking feature of the weather for the month of October has been the marked deficiency in rainfall throughout the Pacific Coast States. The cause of this decrease in precipitation is due to a falling off in the number of storms which have entered the North Pacific Coast from the Japan Current, and also, and more especially, to the fact that these storms have passed eastward at a higher latitude than in previous Octobers. In order to illustrate this very important fact, I have prepared a set of storm-track charts for October, 1889, and 1890. A glance at these charts will show the relation between the extreme southerly position of the storm paths in October, 1889, and the extraordinary rainfall of that month, and the relation between the extreme northerly position of the storm paths and the marked deficiency of rainfall for October, 1890. The amount and distribution of rainfall dependent upon the latitude of the storms from the Japan Current, is one of the most important features of Pacific Coast weather, and is worthy of the careful attention of the public.

RAINFALL.—Except in Arizona, the rainfall is everywhere deficient. The decrease varies from .20 of an inch at Baker City and Keeler to 2.95 inches at Eureka, and 2.13 inches at Olympia. The excess varies from .88 of an inch at Fort Grant to 1.58 inches at Yuma. Rain fell on the following dates in Washington: 1st to 8th, 11th to 24th; Oregon: 1st to 8th, 11th to 14th, 16th to 19th, 22d; California: 1st to 3d, 9th, 10th, 18th, 19th; Nevada: 1st, 2d, 9th to 11th, 14th; Arizona: 1st to 4th, 10th to 12th. The heaviest rainfalls in 24 hours were 1.50 inches at Yuma on the 4th, and 1.22 inches at Fort Canby on the 5th. The heaviest monthly rainfalls were Fort Canby 5.30 inches, Portland 2.80 inches, Olympia 2.60, and Yuma 1.70. The following stations reported no rainfall during the month: San Francisco, Sacramento, Red Bluff, Fresno, Los Angeles, San Diego. Snow was reported as follows on the mountains: California, 9th, 10th, 20th; Nevada, 9th, 10th; Washington, 16th.

STORMS.—Hail storm near Tucson, Arizona, 4th. Thunder storms: Arizona, 4th; California, 17th. High winds on the Oregon and Washington coast, 2d, 5th, 6th to 9th, 13th, 15th, 18th, 20th, 24th, 27th, 28th. The maximum wind velocity at Fort Canby varied from 36 miles per hour on the 6th to 72 miles per hour on the 18th. Crescent City, Cal., high wind and heavy sea on the 28th.

TEMPERATURE.—The temperature has been generally above the normal. The excess ranges from 1° at Olympia to 10° at Los Angeles. The deficiency ranges from 2° at Eureka to 4° at Baker City. It remains stationary at Fort Canby and Fresno. The highest temperature—98°—occurred at Los Angeles on the 21st and 27th. The lowest temperature—20°—occurred at Baker City on the 15th. Frost occurred on the following dates in California: 3d, 9th to 12th, 14th to 17th, 20th; Oregon: 3d, 7th, 9th to 11th, 15th, 17th, 21st, 30th, 31st; Washington: 3d, 4th, 9th to 11th; Nevada: almost daily; Arizona: 12th. Ice formed at Silverton, Or., 14th.

NOVEMBER, 1890.

Mortality reports received from 103 localities throughout the State, with an estimated population of 752,739, give the number of decedents as 1,133, being a monthly percentage of 1.55 per 1,000, or an annual mortality at the rate of 18.60 per 1,000, which is the largest death rate we have had for many months. This increase is not due to the prevalence of any particular epidemic, but rather to the increased area of country in which diphtheria, typhoid fever, and acute pulmonary diseases have been present. The mortality from pneumonia, for instance, just doubled that for October, and the deaths from diphtheria and croup were also largely in excess of the preceding month.

CONSUMPTION caused the death of 157 persons, which is an increase over last month.

PNEUMONIA was fatal in 110 instances, which is double the increase over last report.

BRONCHITIS caused 24 deaths.

CONGESTION OF THE LUNGS was fatal in 19 cases.

WHOOPIING-COUGH caused 2 deaths.

DIPHTHERIA is credited with 58 deaths, which is a largely increased mortality over last report. Thirty-seven of these deaths occurred in San Francisco, 4 in Alameda, 3 each in Los Angeles and Modesto, 2 in Napa, and 1 each in Bakerfield, Tulare, Visalia, Santa Rosa, Santa Paula, Sausalito, San José, Downey, and Lorin.

CROUP.—The mortality from this disease kept pace with diphtheria, 38 deaths being attributed to it, 23 occurring in San Francisco, 1 each in Calico, Colton, Downey, El Monte, Folsom, Healdsburg, Los Angeles, Santa Ana, San José, Woodland, and 4 in Santa Cruz. In each of these places diphtheria was also reported.

CHOLERA INFANTUM was reported as causing 27 deaths, which is a decreased number of deaths from last report.

DIARRHEA AND DYSENTERY were fatal in 16 instances.

SCARLET FEVER caused 5 deaths; 2 in San Francisco, 2 in Woodland, and 1 in San Diego.

MEASLES caused no deaths.

SMALLPOX caused 1 death in San Francisco.

TYPHO-MALARIAL FEVER was fatal in 2 instances only.

TYPHOID FEVER caused 37 deaths, which is the same number as last month, when the disease began to be more frequently observed.

REMITTENT AND INTERMITTENT FEVERS were fatal in but 4 instances.

CEREBRO-SPINAL FEVER is credited with 8 deaths, which is a slight increase.

ERYSIPELAS caused 3 deaths.

CANCER was fatal in 37 instances, which is an increase over last report.

HEART DISEASES were fatal to 76 persons.

ALCOHOLISM caused 16 deaths.

DEATHS FROM CAUSES not classified in this abstract, 441.

PREVAILING DISEASES.

Reports from over 100 localities in different parts of the State indicate a general increase of sickness throughout. There does not appear to be any epidemic prevailing, if we except a decided frequency of throat affections, especially tonsillitis, membranous angina, and diphtheria. The frequency of diseases of the respiratory system is also noticed, and an apparent tendency to the reappearance of epidemic.

INFLUENZA, now familiarly known as "la grippe," is observed by most of our correspondents. The abnormally dry weather which prevailed during the past month seems to have had a deleterious effect upon the general health, and probably determined that frequency to malaise which everywhere is a subject of complaint.

CHOLERA INFANTUM, though usually in abeyance so late in the year, was observed with frequency in many places. It is noticed in reports from Wheatland, Gridley, Redding, Elsinore, Fresno, Visalia, Needles, Martinez, Oakland, Petaluma, San José, and San Francisco.

DIARRHEA AND DYSENTERY were reported as observed, with some frequency, in Blacks, Santa Paula, Oakdale, Wheatland, Pleasanton, Gridley, Downey, Igo, Redding, Mariposa, Elsinore, San Pedro, Eureka, Shasta, Fresno, Visalia, Bakersfield, Needles, El Monte, Brownsville, Oakland, Mendocino, and San Francisco.

MEASLES.—Some few cases were reported in Sausalito, Pleasanton, San Francisco, and Sacramento.

SCARLET FEVER.—A few cases were reported in San Francisco, Sacramento, Sausalito, Newcastle, Pacific Grove, Santa Cruz, Fresno, College City, Woodland, San Diego, and El Monte. Dr. Manson writes that several cases appeared at Graniteville, in Nevada County, of a mild type.

DIPHTHERIA AND CROUP appear to have been almost universally prevalent, being observed in San José, Santa Rosa, Santa Cruz, Santa Ana, Blacks, Santa Paula, Sausalito, Lockeford, Lodi, Newcastle, Elk Grove, Downey, Sacramento, Folsom, Visalia, Downieville, College City, Middletown, Bakersfield, Truckee, Williams, Colton, Lorin, Los Angeles, Modesto, Merced, Calico, Rio Vista, Napa, Oakland, Alameda, and San Francisco. In San Francisco 255 cases were reported during the month. In Alameda, Dr. John T. McLean thinks the prevalence of the disease is, in the main, owing to the imperfect way quarantine is maintained, and the lack of proper isolation of those sick with the disease. In Anaheim, Dr. Bullard writes that he thinks the disease originated in the school-room of a modern school, where the sewer pipe, imperfectly laid, became obstructed and filled with most offensive matter. On having this removed, the prevalence of sore throat

abated. There is a form of sore throat prevailing, which was recognized in Santa Cruz by Dr. Anderson, which, although resembling in some respects diphtheria, is not that disease, being non-contagious, and accompanied by a marked ulceration of the tonsils, but without the characteristic odor of diphtheria. It is seldom fatal, but as it is a matter of difficulty to tell one from the other, the safer plan is to treat all such cases as diphtheria, and isolate them accordingly. In Stockton, Dr. C. A. Ruggles considers diphtheria as bad a disease in a community as smallpox, and, as Health Officer, treats them with the same sanitary precaution, insisting on isolation and strict quarantine. In this manner he has succeeded in literally "stamping out" the disease wherever it has appeared, thus preventing its extension from the place of its development.

WHOOPING-COUGH was reported as still prevalent in Lockeford and Anderson.

ERYSIPELAS was reported in sporadic form in Newcastle, Gridley, Blacks, Alturas, Ontario, Fresno, Truckee, Brownsville, and Bakersfield.

TYPHOID FEVER was observed in a few instances in Newcastle, Wheatland, Downey, Igo, Redding, Fresno, Bakersfield, Truckee, Cloverdale, Calico, Chico, Grass Valley, Lodi, Los Angeles, Marysville, Oakland, Sacramento, San José, San Francisco, Santa Ana, Tulare, and Watsonville. The dryness of the soil, and consequent lowering of the ground water, does not seem to have had the developing effect upon this disease that Pettenkoffer's theory would lead us to expect, as the cases recorded were all due to local causes, which sanitary efforts might have prevented.

TYPHO-MALARIAL FEVER was present in Wheatland, Knights Ferry, San Pedro, Ontario, Visalia, College City, and Truckee.

REMITTENT FEVER is not prevailing to any extent. It was noted in reports from San Francisco, Oakdale, Wheatland, Redding, Benicia, Lockeford, Shasta, Fresno, Cottonwood, Bakersfield, Truckee, Cloverdale, Chico, and Dixon.

CEREBRAL FEVER.—This disease was reported in sporadic form in Berkeley, Los Angeles, Pacific Grove, San Francisco, Vallejo, Redding, San Pedro, and College City.

PNEUMONIA was quite prevalent everywhere. It was noted in reports from Oroville, San José, Stockton, Haywards, Sacramento, Knights Ferry, Pleasanton, Redding, Blacks, Chico, Anderson, Elsinore, Los Angeles, Visalia, Eureka, Lockeford, Glendora, St. Helena, Cloverdale, Alameda, Berkeley, Brownsville, Etna Mills, Grass Valley, Lincoln, Los Gatos, Oakland, and San Francisco. The disease in many cases was of that low form known as *typhoid pneumonia*, and was particularly fatal when attacking persons beyond the middle period of life. In aged persons its fatality was very marked.

BRONCHITIS was also very prevalent, and was reported by all our correspondents as noticed in their districts.

INFLUENZA was very generally noted in our reports, and many of our correspondents considered that la grippe was again prevailing in their districts. The present influenza, so far as noticed, has failed to develop the intense prostration so very characteristic of the genuine la grippe. It is, however, more than probable that this symptom will not be wanting if the disease continues to increase in intensity.

MUMPS was epidemic in Pleasanton.

VARICELLA was observed in Sacramento.

SMALLPOX, we regret to say, has again been imported into San Francisco, this time from Central America by sea. The disease is epidemic in Guatemala, and may have come from this source. Three cases developed in San Francisco during November, and two since then. This should admonish us of the necessity of insisting that our school children be vaccinated as the law contemplates. This precaution would place our children in a condition to resist an invasion of the disease and prevent any extensive epidemic, if such a disaster threatened us. Of the protective power of vaccination against smallpox, there can be no question. History has again and again proven it, and in the last report of the Health Officer in Ireland, he declares that there was not a single case of the disease reported there within the past year, for the reason that vaccination is compulsory, and every one is brought under the operation of the law.

PACIFIC COAST WEATHER SUMMARY.

The most remarkable feature of the weather for the month is the extraordinary deficiency of rainfall. It is a deficiency which affects the entire Pacific Slope from Mexico to British Columbia. The proximate cause for this deficiency is found in the high latitude of the easterly movement of cyclonic areas from the Pacific Ocean. In spite of the fact that there were a large number of these areas, only one of them passed south of the northern boundary of the United States. This area gave rise to a peculiar secondary cyclonic effect, which passed southward into Nevada, and gave rise to the sudden and rather heavy rains in western Arizona and southern California. This secondary area was forced southward by the rapid formation of a high barometer in Washington and Oregon. A weather record for San Francisco, embracing a period of 42 years, shows that never before within that time has the month of November been so deficient in rainfall. The smallest amounts previously recorded are .15 of an inch in 1862, .25 in 1876, and .26 in 1884. A chart with the storm tracks for November, 1884, shows but 3 cyclonic areas, 2 of which passed eastward north of Washington, and the 3d through the northern portion of that State. This slight deflection to the southward of one of those areas was sufficient to give California a few light showers. The cyclonic areas for November, 1890, have been peculiar, not only for their high latitude, but also for their rapidity of movement, which has tended to increase their number, that is unusually large for the month. The rapidity of movement also explains the large number of days on which light showers fell in Wash-

ington and Oregon (nearly two thirds of the month), and the small total of precipitation. The conditions for rainfall were no sooner formed than a change in the cyclonic circulation drove them away. It is not within the province of this review to discuss the question as to the cause of the extreme northerly movement of the cyclonic areas for this month.

RAINFALL.—It is everywhere deficient, and the amount of such deficiency varies from .06 of an inch at Keeler to 6.15 inches at Olympia. The deficiency increases in amount from south to north, and is especially remarkable north of the 38th parallel. Rain fell on the following dates in Washington: 5th, 11th, 13th, 14th, 17th, 18th, 22d to 24th, 26th to 28th. Oregon, 5th to 8th, 11th, 22d to 27th. California, 5th to 7th, 22d to 25th. Nevada, 6th to 9th. Arizona, 6th to 8th. The heaviest rainfalls in 24 hours were .66 of an inch at Fort Canby on the 8th, and .56 of an inch at San Diego on the 7th. A fall of 2.65 inches was reported from Globe, Arizona, on the 8th. The heaviest monthly rainfalls were .70 of an inch at San Diego and Olympia. The following stations report no rainfall: Walla Walla, Winnemucca, Red Bluff, Sacramento, and San Francisco. Snow is reported as follows: Washington, 6th, Whitman County; Oregon, 6th, Harney County; California, 5th, Plumas, Yuba, and Sierra Counties, 2 to 24 inches; 6th, Ventura County; Nevada, 6th and 8th; Arizona, 8th, on Pinal Mountains.

LOCAL STORMS.—Hail storm at Belotta, Cal., 8th. Thunder storm at Quincy, Cal., 5th. High "northers" occurred in California on the 11th and 12th, during the prevalence of an area of extremely high barometer in northern Nevada, Idaho, and Oregon. The barometer during this time was from 40 to 60 of an inch above the normal. In some places the wind was reported as reaching a velocity of over 60 miles per hour, causing damage to fences, trees, and roofs of buildings. Floods were reported from western Arizona on the 8th, causing high water in the Gila and Colorado Rivers.

TEMPERATURE.—It has been above the normal in all districts. The excess ranges from 3° at Olympia to 12° at Los Angeles. The highest temperature, 96°, occurred at Los Angeles on the 3d. The lowest, 10°, occurred at Winnemucca on the 13th.

Abstract of the Reports of Deaths and their Causes in California during November, 1890.

LOCATIONS AND AUTHORITIES.	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26																									
	Other Causes	Alcoholism	Heart Diseases	Erysipelas	Cancer	Cerebro - Spinal Fevers	Remittent and Intermittent Fevers	Typhoid Fever	Typho - Malarial Fever	Whooping-Cough	Smallpox	Measles	Scarlet Fever	Croup	Diphtheria	Other Diseases of St'mach & Bow'ls	Cholera Infantum	Diarrhœa and Dysentery	Congestion of the Lungs	Acute Bronchitis	Acute Pneumonia	Consumption	Total Deaths	Estimated Population		
Alturas, Dr. J. M. Forrest	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2,250		
Alameda, Dr. John T. McLean	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	11,250		
Anaheim, Dr. J. H. Bullard	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2,000		
Antioch, Dr. W. S. George	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2,000		
Anderson, Dr. O. P. Paulding	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1,500		
Auburn, A. S. Waldo, H. O.	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1,600		
Azus and vicinity, Dr. J. H. Miller	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	950		
Bakersfield (Oct. & Nov.), Dr. C. A. Rogers	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	3,200		
Benicia, Dr. E. Gray	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2,800		
Berkeley, Dr. F. H. Payne	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4,000		
Blacks, Dr. F. M. Stratton	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1,000		
Brownsville, Dr. L. C. Crossman	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	600		
Calico, Dr. A. R. Rhea	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1,600		
Cedarville, Dr. B. Woodbridge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,500		
Colton, Dr. M. F. Price	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2,500		
Cottonwood, Dr. J. O. Smith	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1,200		
College City, Dr. C. H. Gibbons	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	700		
Cloverdale, Dr. R. S. Markell	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1,700		
Chico and vicinity, Dr. W. King	19	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	10,000		
Davisville, Dr. W. E. Bates	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	800		
Dixon, Dr. A. Trafton	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2,500		
Downeyville, Dr. A. Jump	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1,000		
Downey and vicinity, Dr. Q. J. Rowley	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2,500		
Etna Mills, Dr. E. W. Bathurst	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	750		
Elk Grove, Dr. J. A. McKee	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	500		
Eureka and vicinity, Dr. S. B. Foster	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10,000		
Elsinore, Dr. T. E. Ellis	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1,200		
El Monte, Dr. F. P. Cave	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	800		
Forest Hill and vic., Dr. Paul Reudy	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3,000		
Fresno, Dr. T. M. Hayden	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	9,000		
Folsom, Dr. B. F. Bates	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1,500		
Galt, Dr. A. Montague	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,000		
Grass Valley and vic., Dr. W. C. Jones	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	6,000		

DECEMBER, 1890.

Mortality reports received from 93 localities in different parts of the State, with an estimated population of 744,169, give the number of decedents as 1,196, being a monthly percentage of 1.67 per 1,000, or an annual mortality of 20.04, which is a higher death rate than that of the preceding month, and the largest death rate we have had since January of last year, when epidemic influenza gave us a like increased percentage of mortality. The increased death rate during December was owing to the increase and fatality of diseases of the respiratory organs, including diphtheria and croup.

CONSUMPTION caused the death of 169 persons, which is an exceptionally large mortality for the month.

PNEUMONIA was credited with 140 deaths, which is a large increase over the deaths in November, when the mortality was considered quite high from this disease.

BRONCHITIS caused 28 deaths, a slight increase over the preceding month.

CONGESTION OF THE LUNGS was reported fatal in 9 instances only.

WHOOPIING-COUGH was fatal in but 1 instance.

DIPHTHERIA is credited with 63 deaths, which is an increased mortality over that of November. Thirty-three of these deaths occurred in San Francisco, 6 in Alameda, 9 in Los Angeles, 2 in El Monte, 2 in Oakland, 2 in College City, 2 in Santa Ana, and 1 each in Antioch, Downey, Modesto, Sacramento, Santa Cruz, Sausalito, and Stockton.

CROUP, so closely allied to diphtheria as to be almost synonymous with it, caused 35 deaths. Of these, 20 occurred in San Francisco, 2 each in Los Angeles, Sausalito, San José, Sacramento, College City, and 1 each in Folsom, Haywards, Pasadena, Stockton, and Woodland.

CHOLERA INFANTUM.—The mortality from this disease has decreased, 12 deaths only being attributed to it.

DIARRHŒA AND DYSENTERY were fatal in but 9 instances, which is also a decrease.

SCARLET FEVER caused but 2 deaths, 1 in Eureka and 1 in Sacramento.

MEASLES was fatal in 1 instance.

SMALLPOX caused 3 deaths, all in San Francisco.

TYPHO-MALARIAL FEVER was fatal in 5 instances.

TYPHOID FEVER is credited with 31 deaths, which is a slight decrease from the mortality from this cause last month.

REMITTENT AND INTERMITTENT FEVERS are reported to have caused 5 deaths.

CEREBRO-SPINAL FEVER is credited with 5 deaths.

ERYSIPELAS caused but 3 deaths.

CANCER was fatal in 34 instances.

HEART DISEASE caused 84 deaths.

ALCOHOLISM caused the large number of 28 deaths.

DEATHS FROM CAUSES not classified in this abstract, 478.

PREVAILING DISEASES.

Reports of sickness from 100 localities in different parts of the State indicate a continued increase of sickness. Inflammatory affections of the chest and bowels seem to be particularly prevalent. This is probably owing to the changes in temperature during the month of December, together with the severe storms, and, in many places, damp fogs that were quite trying to many persons.

INFLUENZA was quite prevalent throughout the State. The form is much milder than that of last December, and, as a rule, is less depressing and debilitating. It may, however, take on a severer form during the present month, and increase our mortality returns.

PNEUMONIA was quite prevalent during the month, and of a very fatal character. It was noticed in reports from Ione, Bakersfield, Alameda, Anaheim, Antioch, Azusa, Pleasanton, Salinas, Hollister, Mariposa, College City, Berkeley, Colton, Cottonwood, Chico, Millville, Etna Mills, El Monte, Alturas, Downey, Lakeport, Galt, Redding, Lockeford, Gridley, Downieville, Grass Valley, Haywards, Los Angeles, Modesto, Sacramento, San José, San Francisco, Santa Ana, Santa Rosa, Vallejo, Watsonville, Calico, St. Helena, Biggs, and Stockton. The sudden onset of this disease and the rapidity of its course, mark it as one requiring prompt medical treatment if we would save life. The commonest cause of its development is the transit of the heated body into a cold atmosphere, or, quite as common, is the chilled body introduced into a dry and heated air; in both cases a congestion of the lungs is induced, which may be only temporary, and pass away, or, in those susceptible to inflammatory diseases, may develop into a pneumonia which will speedily terminate life. The preventive measures are, never to go from a hot room into the cold air without the intervention of a woolen or silk muffler over the mouth and nose, through which the air may be warmed before entering the lungs. If we would take the commonest sanitary precautions in our adaptations to changes of temperature, we would escape many affections of our lungs which we now largely invite by gross carelessness and inattention to hygienic rules.

BRONCHITIS prevailed quite as extensively as pneumonia, but its type was not so severe. It was noted as observed in almost every report received, and, in some places, was almost epidemic in form.

WHOOPIING-COUGH was noticed in San Francisco, North San Juan, Lincoln, Elk Grove, Sacramento, and Cloverdale. The type of this disease was mild, its persistence being the most notable feature of its presence.

DIPHTHERIA AND CROUP were quite prevalent, being noted in reports from San Francisco, Alameda, Sacramento, Salinas, Los Angeles, Antioch, College City, Lodi, Visalia, Eureka, Benicia, Etna Mills, Elk Grove, Downey, Sausalito, Truckee, Middletown, Pacific Grove, Anaheim, Williams, Lockeford, El Monte, Modesto, Oakland, Ontario, Santa Ana, San José, Stockton, Woodland, Folsom, and San Francisco.

SCARLET FEVER, in a mild form, was observed in Sacramento, Contra Costa County, Blacks, Eureka, Azusa, College City, Middletown, Galt, and San Francisco.

MEASLES was noted in San Francisco, Sacramento, Colton, Pleasanton, and Ontario.

SMALLPOX.—There were a few cases of smallpox in San Francisco during December. There is only one case now in the pesthouse, and he is convalescent. No further trouble is anticipated with the disease, except it is again imported and concealed. San Francisco is so well vaccinated that smallpox can make no headway among its inhabitants. If our vaccination law were enforced, the same might be said of the whole State.

ERYSIPELAS, in sporadic form, was noted in Sacramento, Concord, Salinas, Ontario, Lincoln, Hollister, Truckee, Etna Mills, Cottonwood, Oakdale, Brownsville, Alameda, and Grass Valley. The type was mild, with very limited mortality.

TYPHOID FEVER did not prevail to the extent we would expect at this season of the year. Sporadic cases were reported in Bakersfield, North San Juan, Salinas, Igo, Mariposa, Visalia, Etna Mills, Lakeport, Redding, Galt, Wheatland, Gridley, Alameda, Fresno, Lake, Los Angeles, Oakland, Orland, Redding, San José, Santa Ana, Santa Barbara, San Diego, Santa Paula, Vacaville, and San Francisco.

TYPHO-MALARIAL FEVER.—A limited number of cases of this disease were reported in College City, San Pedro, Truckee, Redding, Wheatland, Oakland, Fresno, and San Francisco.

REMITTENT AND INTERMITTENT FEVERS are not very prevalent at present. They were noted in reports from Ione, Bakersfield, Visalia, Truckee, Knights Ferry, Wheatland, Los Angeles, Marysville, and Fresno. As these fevers are more or less under the influence of meteorological conditions, we may expect the continuance of cold weather to lessen their prevalence in a marked manner.

CEREBRAL FEVER was reported in a few instances in North San Juan, San Pedro, Downey, Knights Ferry, Wheatland, Anaheim, Gridley, Rocklin, and San Francisco.

We desire this month to call the attention of every Health Officer to the necessity of having all premises containing or having contained cases of infectious disease, properly fumigated and disinfected under their supervision, and to discourage, or, if possible, forbid the holding of a public funeral in every case of scarlet fever or diphtheria. Day by day we are called upon to record cases of disease contracted in this way. A general law should be passed making it a penal offense to fail to notify the public, by some distinctive flag or notice, of the presence of communicative disease, and any one holding a public funeral, where the cause of death is infective, should be severely punished.

PACIFIC COAST WEATHER SUMMARY.

The month of December has been distinguished by the following important features: (1) The extreme southerly movement of the heavy storm of 2d to 5th. (2) Heavy and continuous fogs in Northern California, 7th to 30th. (3) The barometric trough from the Washington coast southeastward to central Nevada attending the storm of 29th and 30th. (4) Heavy storms at sea, off the Washington coast, on 3d, 4th, 14th, 17th, 18th, and 25th. (5) The heavy storm of the 25th, in northern Oregon and Washington, causing much destruction of property in various cities, especially Seattle. (6) Warm weather in southwestern California, 6th to 30th. (7) General deficiency in rainfall. (8) Frosts in Southern California and southern Arizona. (9) The large number of cyclonic areas passing eastward north of Washington. (10) The high barometer in Nevada, 8th to 28th. In connection with the development of fogs during the month, it is important to note that they prevailed during the period of high barometer in northern Nevada. This high pressure began immediately upon the disappearance of the heavy storm in the first week of the month, and was dissipated by the formation of the barometric trough on the 29th and 30th, which latter date marks the termination of the heavy fog period. Under the influence of this high pressure area in northern Nevada, cold northerly winds and fogs prevailed in Northern California, and warm northerly winds in Southern California, which condition illustrates the extreme heating effect of the desert regions of southeastern California upon the air which passes over them.

RAINFALL.—There has been a general deficiency of rainfall, except a slight excess in the San Joaquin Valley and in southern Arizona. Of the eleven cyclonic areas which appeared off Vancouver Island during the month, all passed eastward north of Washington except two, one of which reached southward into the extreme northern portion of California, and the other passed eastward across northern Washington. This high latitude of the eastern movement of the storm areas explains the deficiency in rainfall. The deficiency ranges from .18 of an inch at Keeler to 4.01 at Portland, and is most marked in Oregon. The deficiency in California varies from .43 of an inch at Los Angeles to 1.95 inches at San Francisco. The rainfall at San Francisco during a period of forty-two years has been less than the present amount (3.25 inches) during fourteen previous Decembers. The smallest amount in a period of forty-two years was a trace in 1876. The next smallest amount was .33 in 1874, and .58 in 1865 and 1878. The excess in southern Arizona is .12 of an inch at Yuma and .30 at Fort Grant. The excess in the San Joaquin Valley is 1.02 inches at Fresno. The heaviest rainfall in twenty-four hours was 2.74 inches on the 21st at Olympia, at which station, also, the heaviest monthly rainfall

(8.10 inches) occurred. Rain fell in Washington 1st to 6th, 10th to 15th, 17th to 25th, 28th to 31st; snow on 20th. Oregon, 1st to 4th, 6th, 10th to 25th, 29th to 31st; snow, 4th, 5th, 30th, 31st. California, 2d to 5th, 10th to 14th, 18th to 20th, 21st, 23d, 25th, 28th to 31st; snow, 2d to 5th, 18th, 19th, 30th, 31st. Nevada, 2d to 5th, 19th, 30th, 31st; snow, 2d to 5th, 8th, 13th, 19th, 20th, 30th, 31st. Arizona, 4th to 6th, 10th, 11th, 18th, 30th, 31st; snow, 5th.

LOCAL STORMS.—Thunder storms: Astoria, Oregon, 19th; Sacramento, 3d; Port Angeles, Washington, 20th; with snow, hail storms, Sacramento, 3d, Stockton, 30th. The highest wind velocity at Fort Canby was 52 miles southeast 2d, 52 southeast 14th, 60 south 18th, 56 southwest 19th, 64 southwest 21st, 44 south 23d, 48 southeast 10th. At San Francisco the maximum velocity was 43 miles southwest on 3d.

TEMPERATURE.—It has been generally above the normal, except in Northern California, where the deficiency ranges from 1° to 4°. The excess is most marked in Southern California, southern Arizona, and eastern Washington, where the amount ranges from 7° to 9°. The highest temperature, 82°, occurred at Los Angeles on the 26th. The lowest, 12°, occurred at Winnemucca on the 10th and 12th.

Abstract of the Reports of Deaths and their Causes in California during December, 1890.

LOCATIONS AND AUTHORITIES.																										
	Other Causes	Alcoholism	Heart Diseases	Erysipelas	Cancer	Cerebro - Spinal Fevers	Remittent and Intermittent Fevers	Typhoid Fever	Typho - Malarial Fever	Whooping-Cough	Smallpox	Measles	Scarlet Fever	Croup	Diphtheria	Other Diseases of St'mach & Bow'ls	Cholera Infantum.	Diarrhoea and Dysentery	Congestion of the Lungs	Acute Bronchitis	Acute Pneumonia	Consumption	Total Deaths	Estimated Population		
Alturas, Dr. J. M. Forrest	0	1	2	0	0	0	0	0	5	4	1	0	0	0	0	0	0	0	0	0	0	0	1	2,250	Alturas, Dr. J. M. Forrest	
Alameda, Dr. John T. McLean	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	11,250	Alameda, Dr. John T. McLean		
Anaheim, Dr. J. H. Bullard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2,000	Anaheim, Dr. J. H. Bullard		
Anderson, Dr. O. P. Paulding	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,500	Anderson, Dr. O. P. Paulding	
Antioch, Dr. W. S. George	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3,000	Antioch, Dr. W. S. George		
Azusa and vicinity, Dr. J. H. Miller	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2,000	Azusa and vicinity, Dr. J. H. Miller		
Bakersfield, Dr. C. A. Rogers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	3,000	Bakersfield, Dr. C. A. Rogers		
Benicia, Dr. E. Gray	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2,900	Benicia, Dr. E. Gray		
Berkeley, Dr. F. H. Payne	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4,000	Berkeley, Dr. F. H. Payne		
Blacks, Dr. F. M. Stratton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,000	Blacks, Dr. F. M. Stratton		
Biggs, Dr. O. C. Hawkins	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,000	Biggs, Dr. O. C. Hawkins		
Brownsville, Dr. L. C. Crossman	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	600	Brownsville, Dr. L. C. Crossman		
Calico, Dr. A. E. Rhea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,600	Calico, Dr. A. E. Rhea		
College City and vic, Dr. C. H. Gibbons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	700	College City and vic, Dr. C. H. Gibbons		
Cedarville, Dr. B. Woodbridge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1,500	Cedarville, Dr. B. Woodbridge		
Colton, Dr. M. F. Price	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	2,500	Colton, Dr. M. F. Price		
Cottonwood, Dr. J. O. Smith	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1,200	Cottonwood, Dr. J. O. Smith		
Cloverdale, Dr. H. S. Markell	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1,700	Cloverdale, Dr. H. S. Markell		
Chico and vicinity, Dr. W. King	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	10,000	Chico and vicinity, Dr. W. King		
Downville, Dr. A. Jump	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1,000	Downville, Dr. A. Jump		
Downey and vicinity, Dr. Q. J. Rowley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2,500	Downey and vicinity, Dr. Q. J. Rowley		
Etna Mills, Dr. L. W. Bathurst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	750	Etna Mills, Dr. L. W. Bathurst		
Elk Grove, Dr. J. A. McKee	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	500	Elk Grove, Dr. J. A. McKee		
El Monte, Dr. F. P. Cave	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	800	El Monte, Dr. F. P. Cave		
Eureka, Dr. S. B. Foster	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	10,000	Eureka, Dr. S. B. Foster		
Elsinore, Dr. T. E. Ellis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1,200	Elsinore, Dr. T. E. Ellis		
Forest Hill and vic, Dr. Paul Reudy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3,000	Forest Hill and vic, Dr. Paul Reudy		
Fresno, Dr. T. M. Hayden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	9,000	Fresno, Dr. T. M. Hayden		
Folsom, Dr. B. F. Bates	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1,500	Folsom, Dr. B. F. Bates		
Galt, Dr. A. Montague	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2,000	Galt, Dr. A. Montague		
Grass Valley, Dr. W. C. Jones	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	6,000	Grass Valley, Dr. W. C. Jones		
Gonzales, C. A. E. Hertel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500	Gonzales, C. A. E. Hertel	
Gridley, Dr. J. T. Harris	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1,000	Gridley, Dr. J. T. Harris		

REPORT OF THE STATE BOARD OF HEALTH.

ABSTRACT FOR DECEMBER, 1890—Continued.

Other Causes	1	0	0	0	0	0	0	1	1	1	0	36	2	1	1	1	3	5	2	33	0	1	0	0	0	2	3	3	1	1	2		
Alcoholism.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0		
Heart Diseases	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0		
Erysipelas.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Cancer	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Cerebro - Spinal Fevers.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
Remittent and Intermittent Fevers	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Typhoid Fever	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Typho - Malarial Fever.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Whooping-Cough..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Smallpox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Measles.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Scarlet Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Croup	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Other Diseases of St'mach & Bow'ls	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Cholera Infantum.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Diarrhœa and Dysentery.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Congestion of the Lungs	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Acute Bronchitis..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Acute Pneumonia.	3	1	0	0	1	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Consumption.....	1	0	1	0	0	0	0	0	0	0	0	15	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total Deaths	7	1	1	0	1	0	0	0	0	0	0	80	23	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Estimated Population	1,200	1,200	600	1,800	1,250	500	1,000	6,000	2,000	2,000	2,000	65,000	4,000	1,500	500	2,000	1,000	800	2,000	3,000	1,500	60,000	12,000	2,000	3,000	1,000	10,000	8,000	3,600	1,350	2,000		
LOCATIONS AND AUTHORITIES.	Haywards, Dr. G. E. Alexander.....	Hollister, Dr. J. H. Tebbetts.....	Go, Dr. H. Schafer.....	one, Dr. A. L. Adams.....	Knights Ferry, Dr. J. H. Lowe.....	Lockeford, Dr. E. N. Foote.....	Lincoln, Dr. Chas. Clark.....	Lake County, Dr. S. E. Mather.....	Long Beach, Dr. J. W. Wood.....	Lodi, Dr. E. A. Burchard.....	Los Angeles, Dr. G. MacGowan.....	Marysville, Dr. D. Powell.....	Mendocino, Dr. J. W. Milliken.....	Millville, Dr. J. N. Crabb.....	Modesto, Dr. W. J. Wilhite.....	Mariposa, Dr. W. J. Kenney.....	Middletown, Dr. R. E. Hartley.....	Martinez, Dr. J. B. Tennant.....	Nevada City, Dr. R. F. Waggoner.....	National City, Dr. T. F. Johnson.....	Oakland, Dr. D. D. Crowley.....	Oakdale, Dr. R. H. Endicott.....	Oroville, Dr. J. H. M. Karsner.....	Orland, Dr. W. Thurston.....	Ontario, Dr. W. E. Scott.....	Pasadena and vicinity, Dr. H. H. Sherk.....	Petaluma, Dr. L. H. Patty.....	Pomona and vicinity, Dr. S. F. Davis.....	Pacific Grove, Dr. O. S. Trimmer.....	Rio Vista, Dr. S. C. Brown.....	Redding, Dr. F. P. Mitchell.....	Riverside, Dr. W. B. Sawyer.....	Stockton, Dr. A. M. Stafford.....

JANUARY, 1891.

Mortality reports received from 94 localities in different parts of the State, with an estimated population of 736,100, give the number of decedents as 1,213, being a monthly percentage of 1.64+, or an annual mortality of 19.68, which is a fraction lower than the percentage of December, but still much larger than usual. The continued high mortality is attributable to the prevalence of diseases of the respiratory system, the advent of a fresh epidemic of la grippe, with the extensive diffusion of diphtheria and croup.

CONSUMPTION exemplifies the epidemic influence that prevails with the increased mortality of 193 deaths in January.

PNEUMONIA is credited with 138 deaths, about the same as reported in the previous month.

BRONCHITIS caused 47 deaths, which is nearly double that of December.

CONGESTION OF THE LUNGS was fatal in 19 instances.

WHOOPING-COUGH caused 3 deaths.

DIPHTHERIA was fatal in 65 instances; of these, 38 occurred in San Francisco, 4 in Los Angeles, 3 each in Sacramento, Alameda, Rio Vista, and Santa Cruz; 2 each in Visalia, San José, El Monte, and Napa; and 1 each in Anaheim, Merced, and Santa Ana.

CROUP also shows a mortality of 92, which is a decrease from the report in December of these deaths. Sixteen occurred in San Francisco, 2 in San Diego, 1 each in College City, Long Beach, Napa, and Santa Ana.

CHOLERA INFANTUM is credited with 4 deaths only.

DIARRHŒA AND DYSENTERY likewise caused but 4 deaths, which is a remarkably small mortality, considering the frequency of the disease.

SCARLET FEVER caused but 4 deaths, 2 of them in San Francisco, 1 in San Diego, and 1 in Colton.

MEASLES was fatal in but 1 instance, in San José.

TYPHO-MALARIAL FEVER is credited with but 2 deaths.

TYPHOID FEVER was reported as causing but 20 deaths, which is an exceedingly low mortality for this disease, considering its prevalence. The type is evidently of a mild character.

REMITTENT FEVER caused only 3 deaths.

CEREBRO-SPINAL FEVER is credited with 9 deaths, which is a slight increase over last month.

ERYSIPELAS caused 7 deaths, which is an increase over last report.

CANCER was fatal in 37 instances.

HEART DISEASE was credited with 98 deaths.

ALCOHOLISM caused 14 deaths.

DEATHS FROM CAUSES not classified in this abstract, 458.

PREVAILING DISEASES.

Reports received from 94 localities in different parts of the State indicate that sickness is still prevalent, although not more so than in December, if we except those diseases affecting the respiratory system. There is no doubt that inflammatory disease of the lungs prevails extensively throughout the State, and that another epidemic of la grippe is fast developing. The particular feature about epidemic influenza this winter is the great tendency it exhibits to pass from the air tubes into the air cells, thus constituting pneumonia, which in many cases it does so quietly that to an ordinary observer it is unnoticed until death steals upon its victim. As a matter of wise precaution all cases of la grippe should be brought under the notice of a reputable physician before they have advanced to a dangerous stage of the malady, as *latent pneumonia*, which can only be detected by a skilled practitioner, may be advancing. The absence of the usual rainfall in January, together with the cold nights and fogs, seemed to have some influence in determining the frequency of coughs and colds, of which most every one complained. Disorders of the alimentary canal were not so frequently reported as in December, and no zymotic disease prevailed in an epidemic form.

CHOLERA INFANTUM.—Sporadic cases of this disease were reported in Merced, Santa Ana, North San Juan, and Monterey. It is not at all prevalent.

DIARRHŒA AND DYSENTERY were observed with some frequency in Visalia, College City, Knights Ferry, Bakersfield, San Pedro, Brownsville, Needles, Elsinore, Gridley, Kelseyville, Fresno, El Monte, Downey, and San Diego.

SMALLPOX.—A single case was reported from Humboldt County, but no particulars were received as to its origin.

VARICELLA, OR CHICKENPOX, was reported in Mariposa and Sacramento.

MEASLES was prevalent during the month in Pleasanton, Williams, Lockeford, Vacaville, Fresno, Alturas, Downey, Merced, Santa Cruz, San José, and Sacramento.

SCARLET FEVER was reported in San Diego, Hollister, Sacramento, San Francisco, Colton, Oakdale, El Monte, Napa, Middletown, Santa Cruz, Pacific Grove, Dixon, College City, and Modesto. In San Diego Dr. T. L. Magee reports that the disease was very mild, and that among the 84 cases notified at the Health Office only one death occurred. In Dixon the disease was almost epidemic, but no fatality resulted from it.

DIPHTHERIA AND CROUP.—Sporadic cases of these diseases were observed in many localities—Visalia, Eureka, Truckee, Napa, Azusa, Santa Ana, Downey, Los Angeles, San Diego, College City, San Luis Obispo, Anaheim, Sacramento, San José, San Francisco, Fresno, Mariposa, Pacific Grove, Santa Cruz, Modesto, Merced, Lodi, El Monte,

and Alameda. The disease reported by the press in Antelope Valley consisted in a limited outbreak in one family, the mother and three children being seized with it. According to the report of Dr. Fife, the disease was exceptionally malignant, proving fatal to the three children, the mother recovering. The source of the disease was supposed to be a child living in Antelope that died suddenly of some throat trouble, the nature of which was not known. From this the lesson may be learned that the simplest sore throat requires attention, as what may seem to be quite innocent in its nature may give rise to the most malignant and fatal disease. At the International Medical Congress the question was asked, "How long can a diphtheritic patient furnish infectious excretions?" In reply to this it was stated that excretions were found infectious three weeks after apparent recovery, and pieces of membrane yielded cultures fourteen weeks after discharge from the throat. Children having had the disease should therefore be kept from school for at least four weeks after recovery, and every article of apparel worn by them should be thoroughly disinfected. All doubtful cases of throat disease should be treated as diphtheritic until the contrary is clearly shown; by this means a danger would be averted that under any course might be imminent.

WHOOPING-COUGH is abating; a few cases were observed in Sacramento.

ERYSIPELAS was reported in Sacramento, College City, Knights Ferry, Bakersfield, Etna Mills, Fresno, Downey, San Francisco, Dixon, and Modesto. The type was generally mild.

TYPHOID FEVER is not prevalent in any part of the State. Some sporadic cases were reported in San Francisco, Eureka, Bakersfield, Etna Mills, Igo, Lockeford, Santa Ana, Fresno, Sacramento, Merced, Calico, El Monte, and Cedarville. The type is mild so far as heard from.

TYPHO-MALARIAL FEVER was reported in Visalia, College City, Knights Ferry, Redding, Oakdale, San Pedro, Cottonwood, Galt, Gridley, Merced, and Wheatland.

CEREBRAL FEVER.—Sporadic cases of this disease were observed in Redding and Napa.

PNEUMONIA was reported as present in Eureka, Pleasanton, Biggs, Bakersfield, Igo, Etna Mills, Truckee, Benicia, Redding, Brownsville, Lockeford, San José, Galt, College City, Anderson, Watsonville, Gridley, San Luis Obispo, Anaheim, Fresno, Alturas, Shasta, Dixon, Wheatland, Merced, San Francisco, Alameda, Oakland, and Sacramento.

BRONCHITIS was prevailing to a greater or less extent in every precinct heard from.

INFLUENZA appears in almost every report. In some places it is quite epidemic, and partakes of all the characteristics of la grippe, being attended by debility and great prostration. In many cases it is preliminary to a low form of pneumonia, which is said to be particularly fatal, owing to the depressing influences of the accompanying influenza.

PACIFIC COAST WEATHER SUMMARY.

The month of January has been notable for the following important features: (1) The high latitude of the easterly movement of cyclonic areas. (2) Although the approximate paths of 8 cyclones have been charted for the month, in no case did the center of any storm reach southward into Washington. (3) The marked deficiency in precipitation throughout the Pacific Coast States. (4) General increase in temperature in all districts, especially in Washington. (5) The periods of fair weather in Washington and Oregon from the 7th to the 14th, and from the 19th to the 23d, when this region was occupied by an anti-cyclone. (6) The slow movement of the cyclonic areas of the month, especially the storm of the 14th to 19th, which required nearly 5 days to pass eastward beyond Washington. (7) The period of high northerly winds in California from the 25th to 30th, when the velocities ranged from 25 to over 40 miles per hour at many places. During this time an anti-cyclone was central on the northwest coast of California and the southwest coast of Oregon. (8) The peculiar development of the cyclone of the 29th to 31st. This storm appeared to remain almost stationary over British Columbia, but with a remarkable influence in diminishing barometric pressure to the southward, without apparently changing the location of its center. The barometer fell slowly but constantly for three days, from Mexico to British America, culminating on the night of the 31st in light rains, with snow in mountains in California, Nevada, Oregon, and Washington. (9) The development of a huge waterspout off the mouth of the Columbia River on the 5th in the southeast current of the cyclone then central off Vancouver's Island. This cyclone first appeared on December 31st last, and remained in the vicinity of Washington until January 6th. The waterspout was reported as of remarkable size and power, moving from southwest to northeast, attended by a loud, roaring noise. It seemed to possess the characteristics of a veritable tornado, and would undoubtedly have caused considerable destruction to property, and perhaps life, if it had passed over the land. (10) The heavy and continuous gales off the Washington coast, especially from the 14th to the 19th, during which time the average daily maximum velocity at Fort Canby was nearly 50 miles per hour. (11) The heavy rains, turning to snow in mountains, in Southern California and southern Arizona on the 28th and 29th, resulting from the high northerly winds and low temperatures—San Diego 1.08 inches of rain and Fort Grant 3 inches of snow.

RAINFALL.—The rainfall has been deficient in all districts, especially in Northern California and western Oregon. The deficiency ranges from .25 of an inch at Keeler to 7.78 inches in Eureka, 4.57 inches at Red Bluff, and 4.08 inches at San Francisco. The rainfall at San Francisco has not been so small since 1852, when the amount reported was .58 of an inch. In 1851 the amount was .72 of an inch. The rainfall for January, 1891, is .98 of an inch. In January, 1862, there was recorded 24.36 inches—the heaviest rainfall ever

reported for San Francisco. The largest monthly rainfall was 6.60 inches, at Fort Canby. No rain fell at Keeler and Yuma. The heaviest rainfall in 24 hours was 1.08 inches at San Diego on the 28th and 29th. Rain fell on 22 days in Washington; in Oregon, 24 days of rain and 5 days of snow; in California, 19 days of rain and 13 of snow; Nevada, 10 days of rain and 17 days of snow; in Arizona, 4 days of rain and 4 days of snow. Local storms: Astoria, Oregon, 2d, thunder, lightning, and hail.

TEMPERATURE.—It has been above the normal in all the districts except northern Nevada, where the deficiency is only 1° at Winnemucca. The excess is most marked in Washington, northern Oregon, and southwestern California, where it ranges from 4° to 13°. The highest temperature, 80°, occurred at Los Angeles, 23d. The lowest, 18°, at Halleck and Carlin, Nevada, 10th.

ABSTRACT FOR JANUARY, 1891—Continued.

Other Causes	1	3	0	0	1	0	1	0	1	0	4	1	1	0	2	3	3	3	3	3	3	4	0	0	1	0	0	0	2	1	1	4	2
Alcoholism	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Heart Diseases	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1
Erysipelas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cancer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cerebro - Spinal Fevers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remittent and Intermittent Fevers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Typhoid Fever	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Typho - Malarial Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Whooping-Cough	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Smallpox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Measles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scarlet Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Croup	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Diseases of St'mach & Bow'ls	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cholera Infantum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diarrhoea and Dysentery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Congestion of the Lungs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Acute Bronchittis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acute Pneumonia	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Consumption	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Deaths	2	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimated Population	1,500	1,200	4,000	1,500	600	1,800	250	500	1,000	7,000	2,000	1,200	500	60,000	5,000	2,500	1,000	500	3,000	5,000	5,000	700	500	60,000	1,000	2,000	3,500	10,000	8,000	1,200	1,900	3,000	5,000
LOCATIONS AND AUTHORITIES.	Hanford, Dr. J. A. Davidson.....	Haywards, Dr. G. E. Alexander.....	Healdsburg, Dr. N. B. Coffman.....	Hollister, Dr. J. H. Tebbetts.....	Igo, Dr. H. Schafer.....	Ione and vicinity, Dr. A. L. Adams.....	Knights Ferry, Dr. J. H. Lowe.....	Lockeford, Dr. E. N. Foote.....	Lincoln, A. C. Fleming, H. O.....	Lake County, Dr. S. R. Mather.....	Long Beach, Dr. J. W. Wood.....	Lodi, Dr. E. A. Burchard.....	Lorin, Dr. E. J. Ashmore.....	Los Angeles, Dr. G. MacGowan.....	Marysville, Dr. D. Powell.....	Merced, Dr. E. S. O'Brien.....	Mariposa, Dr. W. J. Kearney.....	Middletown, Dr. R. E. Hartley.....	Monterey, Dr. O. S. Trimmer.....	Napa, Dr. M. B. Pond.....	Nevada City, Dr. F. R. Waggoner.....	Needles, Dr. J. P. Booth.....	North San Juan, Dr. G. S. Farley.....	Oakland, Dr. D. D. Crowley.....	Oakdale, Dr. R. H. Endicott.....	Oroville, Dr. J. H. M. Karsner.....	Orland, Dr. W. Thurston.....	Pasadena and vicinity, Dr. H. H. Sherk.....	Petaluma, Dr. L. H. Patty.....	Pleasanton, Dr. W. H. Cope.....	Rio Vista, Dr. S. C. Brown.....	Redding, Dr. F. P. Mitchell.....	Riverside, Dr. W. B. Sawyer.....

FEBRUARY, 1891.

Mortality reports received from 85 localities in different parts of the State, with an estimated population of 721,991, give the number of decedents as 1,150, being a monthly percentage of 1.66, or an annual mortality of 19.92, which is a higher percentage than that of January, and shows a continued high death rate for California. This must be attributed to the great prevalence of diseases of the respiratory system, as with the exception of diphtheria, croup, and influenza, no infectious zymotic disease is prevailing.

CONSUMPTION caused 167 of these deaths, which is a decrease of 26 from the mortality of this disease in January.

PNEUMONIA increased its death rate from 138 deaths in January to 160 in February.

BRONCHITIS caused 44 deaths, which is also a high mortality from this disease.

CONGESTION OF THE LUNGS was credited with 18 deaths.

WHOOPING-COUGH was fatal in 4 instances.

DIPHTHERIA is credited with 61 deaths. Of these 38 occurred in San Francisco, 6 in Red Bluff, 4 in Napa, 2 each in Oakland, Los Angeles, Azusa, College City, and Hanford, and 1 each in Modesto, National City, and San José.

CROUP caused 26 deaths—23 in San Francisco, 1 each in El Monte, San José, and Sacramento.

CHOLERA INFANTUM was the cause of only 1 death, which is an evidence of its almost complete absence from the State.

DIARRHŒA AND DYSENTERY are likewise to be noted by their absence, 3 deaths only being recorded from them.

SCARLET FEVER, although quite prevalent in a mild form, caused no deaths.

MEASLES caused 4 deaths in Stockton.

SMALLPOX is absent from the State.

TYPHO-MALARIAL FEVER has only 2 deaths credited to it.

TYPHOID FEVER had the remarkably small mortality of 7 attributed to it. Six of these deaths occurred in San Francisco and 1 in Napa. The limited death rate from this disease may perhaps be attributed to the cleansing of foul sewers and filthy places by the copious rains which visited us during the month. In all events, it is worthy of note.

REMITTENT FEVER caused only 1 death.

CEREBRO-SPINAL FEVER is credited with 7 deaths.

ERYSIPELAS was fatal in but 2 instances.

CANCER caused 33 deaths.

HEART DISEASE was fatal in 100 cases.

ALCOHOLISM caused 9 deaths.

DEATHS FROM CAUSES not classified in this abstract, 445.

PREVAILING DISEASES.

Reports of sickness received from 96 localities in different parts of the State continue to indicate an abnormal amount of illness from those diseases affecting the respiratory system. The bowel disorders, which were so prominent a feature in previous reports, seem to have, in a great measure, subsided, being infrequently mentioned in our disease returns. Even cholera infantum remains unreported. The rainfall being copious during the month, had the salutary effect of flushing and washing the choked drains and sewers, carrying away much decomposing organic matter, the most prolific source of alimentary disorders. To it may be attributed the improved health of the community in its relation to bowel diseases, but how much the increased humidity has contributed to the prevalence of influenza and other diseases of the chest and lungs, it may be difficult to conjecture.

PNEUMONIA prevailed almost everywhere throughout the State. It was reported in some localities as partaking of an epidemic character, and in several instances appeared to be really infectious. One of our Health Officers reports an instance in which the father, mother, brother, and two sisters took the disease, one after the other, in the same house, both parents dying. It was noted in San Francisco, Oakland, Sacramento, Los Angeles, San José, Stockton, Marysville, Grass Valley, Downieville, Red Bluff, Etna Mills, Shasta, Modesto, Merced, San Diego, National City, Salinas, Kelseyville, Watsonville, Middletown, Redding, Truckee, Needles, Pleasanton, Alameda, Downey, Roseville, Hanford, Auburn, Anaheim, Benicia, Bakersfield, Jackson, and Fresno.

BRONCHITIS also prevailed to an alarming extent. The type, however, was not of a serious character, its universality being the most distinguishing feature of its presence.

WHOOPING-COUGH was reported in Sacramento, Elk Grove, Etna Mills, Truckee, Rocklin, Sausalito, San Francisco, Oakland, Salinas, Marysville, and Davisville.

DIPHTHERIA and CROUP were also reported as present during the month in Sacramento, San Francisco, San José, Fresno, Napa, Modesto, Elk Grove, Hanford, College City, Azusa, Los Angeles, Red Bluff, El Monte, Truckee, Sausalito, Rio Vista, National City, and Merced. We believe that the spread of this disease might be materially lessened if the public could be taught to look upon it as it does upon smallpox, and take the same precautions in isolating its victims as it does those of the more loathsome disease, which, while disagreeable to wait upon, is not half so deadly in its results as the diphtheritic poison. Another point upon which it might be well to inform the public is, that where an infectious or contagious disease occurs in a home, and the washing of the patient's bedding or clothing is sent away to be washed without first having them thor-

oughly disinfected, and the washerwoman or any of her family thereby become infected, they can recover damages in a Court of law, if not previously notified or warned that the clothing is infected. A few successful suits of this kind would engender caution and a realization of the fact that public protection must be afforded against infectious disease.

SCARLET FEVER was quite prevalent during the month in many parts of the State. This is a disease that can be effectually quarantined against. Dr. M. F. Price, our Health Officer at Colton, writes: "The epidemic of scarlet fever with which we were threatened the first of the month was *effectually prevented* by strict isolation and quarantine. Only the first four cases occurred. The wisdom of the State and city health laws, with an officer empowered to enforce them, was fully demonstrated in this instance." Dr. T. L. Magee, Health Officer at San Diego, says: "Scarlet fever has almost entirely disappeared by strict isolation and quarantine of those affected." In the southern portion of Sacramento a public school had to be closed, the disease became so prevalent. In this disease, as in smallpox, the poison is given off from the bodies of the sick, and as we have no knowledge of any mode of protection corresponding with vaccination, the obvious means, therefore, of avoiding contagion, is to keep out of reach of the infection by the sick, or of articles infected by them. The difficulty of doing this can be estimated when we learn of the persistence of the vitality of the poison. It is communicable during the whole of the illness and convalescence of the patient. Infected clothing that has been packed away for months may communicate the disease and the instances are numerous where the infection has been carried long distances from the sick by healthy persons who have recently come in contact with scarlet fever. All these facts point to the most rigid exclusion of susceptible children from every possible source of infection.

MEASLES was epidemic in Stockton. Dr. C. A. Ruggles writes that in 20 years he does not remember hearing of so large a mortality in February. It was also noted in Davis, Sacramento, Alturas, Dixon, Lockeford, Redding, Williams, Sausalito, Downey, Benicia, Red Bluff, Fresno, and Cedarville.

ERYSIPELAS.—Sporadic cases of this disease were noted in Modesto, Elk Grove, Anaheim, College City, Knights Ferry, Needles, Williams, Sausalito, Downey, Bakersfield, Salinas, Red Bluff, Fresno, and Newcastle.

TYPHOID FEVER is not prevalent in any portion of the State. San Francisco reports some, and sporadic cases were noted in National City, Etna Mills, Napa, El Monte, Redding, Vacaville, Bakersfield, Salinas, and Wheatland.

TYPHO-MALARIAL FEVER was reported in College City, National City, San Diego, Igo, Cottonwood, Bakersfield, Salinas, Wheatland, Fresno, Gonzales, Lodi, San Francisco, and Galt.

CEREBRAL FEVER.—Sporadic cases of this disease were noticed in North San Juan, Galt, Fresno, Grass Valley, San Diego, San Francisco, Watsonville, and Sacramento.

REMITTENT FEVER was present in Shasta, Lockeford, Knights Ferry, Lodi, Anderson, Truckee, Gridley, Red Bluff, Wheatland, and Oakland.

INFLUENZA, or LA GRIFFE, has, since the last report, developed into a widespread epidemic, equaling, if not exceeding, that which prevailed during the winter of 1889-90. That it spreads by atmospheric influence may be inferred from its rapid diffusion from place to place without any known intermediate intervention of contagion by external media. The present epidemic may be characterized by its sudden onset. The intensity of its initiatory symptoms, the premonitory chill, the fever, headache, backache, pains in the bones and muscles that more nearly resemble *dengue*, or backbone fever, than any other disease we can remember. Another feature peculiar to the present epidemic is the frequency with which cases occur in which the cough is almost entirely absent, and others in which pneumonia of a low type is almost certain to be developed. The debility accompanying the disease is invariably present, and must be treated by stimulants liberally given. The origin of the disease being unknown, the power of the sanitarian over it is exceedingly limited, and consists chiefly in advising the avoidance of all depressing influences that might deteriorate the healthy constitution or impair its strength.

PACIFIC COAST WEATHER SUMMARY.

The month of February has been distinguished by the following important features: (1) The southerly movement of three cyclonic areas which passed eastward through central Oregon, giving rise to the heavy rains, high winds, and high temperatures of the month in California and Nevada. (2) The violent cyclone of February 20th to 24th, which gave rise to remarkably high and destructive winds, heavy rains, and the lowest barometer readings for many years—Baker City, 28.94 inches; San Francisco, 29.10; Red Bluff, 29.02; Fresno, 29.32; Fort Canby, 29.06. (3) Seven cyclonic areas came within the limits of the Signal Service charts during the month, 4 of which passed eastward north of Washington. (4) The anti-cyclone of the 1st to 4th, which gave rise to a severe cold wave in Washington and Oregon, producing the lowest temperatures of the month—Baker City, Oregon, 12° below zero. This cold wave extended southward into Nevada and eastern California on the 4th—Halleck, Nevada, 14° below zero. (5) The anti-cyclone of 7th to 9th, which gave rise to the severe "norther" of the 8th in California; this anti-cyclone was attended by the lowest temperatures of the month in California and Nevada, and destructive winds in California, especially in the southern portion—Halleck, Nevada, 23° below zero on the 9th. Heavy sand storms and killing frosts, with the blowing down of some buildings, attended the "norther" in Southern California.

(6) The high southerly winds, high temperatures, and heavy rains of the 12th to 17th, 20th to 24th, and 26th to 28th, in Northern California and Nevada. (7) From the 9th to the last day of the month the presence of a cyclonic disturbance was manifest without cessation off Vancouver Island.

RAINFALL.—The rainfall has been in excess of the normal in all districts except western Washington and northwestern Oregon. The long spell of drought was broken on the 14th, and in the last half of the month enough rain has fallen to carry the amount decidedly beyond the normal in southern Oregon, California, and Arizona. If this large precipitation could have been distributed over the month, much less damage would have resulted to property and greater benefits derived from the greatly needed moisture. The excess varies from .19 of an inch at Winnemucca to 4.84 inches at Los Angeles, 6.83 at Red Bluff, and 6.78 at Roseburg. The deficiency ranges from .19 of an inch at Fort Canby to 3.55 inches at Olympia. The rainfall at San Francisco has been exceeded in 6 other years during the past 40 years; the largest amount, 12.52 inches, occurred in February, 1878, and the next largest amount, 9.24 inches, in 1887. The largest monthly rainfall was 11.50 inches at Roseburg. The greatest in 24 hours was 3.80 inches at Red Bluff on the 14th. Rain fell on 23 days in Washington, on 26 days in Oregon, on 25 days in California, on 22 days in Nevada, and on 10 days in Arizona.

LOCAL STORMS.—Thunder storms, Eureka, 17th, Gilroy, 24th, Vacaville, 25th. Buildings struck by lightning, Shasta County, 18th. Hail, Eureka, 17th, San Francisco, 24th, Astoria, 6th, 19th, Shasta County, 18th. Winds of over 30 miles per hour have occurred on 2 days at Eureka, 5 days at Fort Canby, 6 days at San Francisco, Red Bluff, and Sacramento, and 14 days at Winnemucca.

TEMPERATURE.—It has been almost stationary in all districts, with a slight excess of 1° to 2° in northern Nevada, western Arizona, and southwestern California. The deficiency ranges from 4° at Keeler to 3° at Red Bluff and Olympia, and 1° at Eureka, Fort Canby, and Spokane Falls. The highest temperature, 74°, occurred at Yuma on the 7th and 14th. The lowest, 23° below zero, occurred at Halleck, Nevada, on the 9th, Baker City, 12° below, on the 2d.

Abstract of the Reports of Deaths and their Causes in California during February, 1891.

LOCATIONS AND AUTHORITIES.	Other Causes	Alcoholism.....	Heart Diseases	Erysipelas.	Cancer	Cerebro - Spinal Fevers.....	Remittent and Intermittent Fevers.....	Typhoid Fever	Typho - Malarial Fever.....	Whooping-Cough.....	Smallpox	Measles.....	Scarlet Fever	Croup.....	Diphtheria	Other Diseases of St'mach & Bow'ls.....	Cholera Infantum.....	Diarrhea and Dysentery.....	Congestion of the Lungs.....	Acute Bronchitis....	Acute Pneumonia.....	Consumption	Total Deaths	Estimated Population
Alameda, Dr. John T. McLean.....	11,250	0	21	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	21	21	1	14	11,250
Anaheim, Dr. J. H. Bullard.....	2,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	2,000
Anderson, Dr. O. P. Paulding.....	1,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1,500
Auburn, A. S. Waldo, H. O.....	1,600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1,600
Azusa and vicinity, Dr. J. A. Miller.....	2,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	8	2,000	
Bakersfield, Dr. C. A. Rogers.....	3,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	6	3,100
Benicia, Dr. E. Gray.....	2,900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2,900
Berkeley, Dr. F. H. Payne.....	4,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4,000
College City, Dr. C. H. Gibbons.....	700	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	1	0	0	3	700
Colton, Dr. M. F. Price.....	2,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,000
Concord, Dr. F. F. Neff.....	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	500
Cottonwood, Dr. J. O. Smith.....	1,250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1,250
Chico and vicinity, Dr. W. King.....	10,000	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0	1	17	10,000
Davisville, Dr. W. E. Bates.....	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1,000
Dixon, Dr. A. Trafton.....	2,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2,000
Downey and vicinity, Dr. Q. J. Rowley.....	2,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	2,500
Etina Mills, Dr. L. W. Bathurst.....	750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	750
El Monte, Dr. F. P. Cave.....	800	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	800
Eureka, Dr. S. R. Foster.....	10,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10,000
Fresno, Dr. T. M. Hayden.....	10,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	10,000
Grass Valley, Dr. W. C. Jones.....	6,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	7	6,000
Gonzales, Dr. C. A. E. Hertel.....	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	500
Gridley, Dr. J. T. Harris.....	1,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1,500
Hanford, Dr. J. D. Davidson.....	1,500	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1,500
Haywards, Dr. G. E. Alexander.....	1,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	6	1,200
Healdsburg, Dr. N. B. Coffman.....	4,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	5	4,000
Igo, Dr. H. Schafer.....	600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	600
Jackson, Dr. E. B. Robertson.....	2,600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	6	2,600
Knights Ferry, Dr. J. H. Lowe.....	250	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	3	250
Lockeford, Dr. E. N. Foote.....	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3	500
Lake County, Dr. S. R. Mather.....	7,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	7,000
Long Beach, Dr. J. W. Wood.....	2,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2,000
Lodi, Dr. E. A. Burchard.....	1,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1,200

REPORT OF THE STATE BOARD OF HEALTH.

ABSTRACT FOR FEBRUARY, 1891—Continued.

Other Causes	26	1	3	2	4	4	1	1	29	1	1	1	6	3	1	0	1	0	21	5	9	221	13	5	17	3	2	0
Alcoholism.....	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	6	0	0	1	0	0	0
Heart Diseases	6	2	2	0	0	0	0	0	4	0	0	0	0	3	0	0	1	0	0	0	2	48	9	0	0	3	0	0
Erysipelas.....	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cancer	1	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	3	0	0	16	1	0	0	0	1	1
Cerebro - Spinal Fevers.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Remittent and Intermittent Fevers.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Typhoid Fever	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	0	0	0	1	0
Typho - Malarial Fever.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Whooping-Cough.....	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Smallpox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Measles.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
Scarlet Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Croup.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	23	1	0	0	0	0	0
Diphtheria	2	0	0	1	0	4	0	1	2	0	0	0	0	0	0	0	0	0	0	0	38	1	0	0	0	1	0	0
Other Diseases of St'mach & Bow'ls.....	5	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	24	5	1	0	0	0	1	1
Cholera Infantum.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Diarrhœa and Dysentery.....	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Congestion of the Lungs.....	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	8	1	0	0	0	1	0	0
Acute Bronchitis.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0	0	0	0	4	0	0
Acute Pneumonia.....	17	2	0	0	0	0	1	0	7	4	0	0	0	0	0	0	0	0	7	0	65	10	0	0	0	2	3	0
Consumption.....	20	0	1	1	0	0	0	0	3	1	0	0	0	0	0	0	0	0	6	1	88	4	0	0	0	0	2	0

[illegible]

MARCH, 1891.

Reports of mortality received from 86 localities in different parts of the State, with an estimated population of 681,497, give the number of decedents as 1,251, being a monthly percentage of 1.83 per 1,000, or an annual mortality of 21.96, which is the largest death rate in any single month that has been recorded for years. This increase in the monthly percentage may be more apparent than real, owing to the correction of the estimated population in those towns and cities reported by the Census Bureau this month. When the population of all the towns is officially declared we will be able to get closer to the actual death rate in California than we are at present.

CONSUMPTION caused 188 deaths, which is above the average mortality from this cause.

PNEUMONIA was fatal in 168 instances, which is above the mortality in January or February, and the largest number yet reported in any single month.

BRONCHITIS caused 38 deaths, which is a slight decrease from the mortality in February.

CONGESTION OF THE LUNGS was credited with 21 deaths.

WHOOPING-COUGH, although quite prevalent, caused but 4 deaths.

DIPHTHERIA is reported to have caused 68 deaths. Of these 49 occurred in San Francisco, 2 each in Chico, Folsom, Modesto, Napa, Oakland, and Orland, and 1 each in Alameda, Berkeley, El Monte, Los Angeles, Pasadena, Pomona, and Visalia.

CROUP had a fatality of 20. Fourteen were reported from San Francisco, and 1 each from Azusa, Newcastle, Pasadena, Watsonville, San José, and Sacramento.

CHOLERA INFANTUM caused 3 deaths, which is conclusive evidence that the disease is not prevalent.

DIARRHOEA AND DYSENTERY were reported as causing 15 deaths, which is quite an increase over the preceding month, when 3 deaths only were recorded from these causes.

SCARLET FEVER, although quite prevalent in many places, is only credited with 3 deaths, which is reliable evidence of the mild character of the disease.

MEASLES is also reported as causing only 3 deaths, from which a like inference as to the type of the disease may be drawn.

TYPHO-MALARIAL FEVER caused no deaths.

TYPHOID FEVER was fatal in 15 instances, a slight increase over the mortality from it last month.

REMITTENT FEVER is credited with 4 deaths.

CEREBRAL FEVER.—Nine deaths were attributed to this disease.

ERYSIPELAS was fatal in 7 instances.

CANCER caused 33 deaths.

HEART DISEASE was fatal in 95 cases.

ALCOHOLISM caused 21 deaths.

DEATHS FROM CAUSES not classified in this abstract, 431.

PREVAILING DISEASES.

Reports of sickness received from 98 localities in different parts of the State show a tendency to abatement in all hitherto prevailing diseases. The lessened rainfall and the increased temperature during the month had a salutary influence in diminishing the prevalence of pulmonary diseases, although the frequency and fatality of pneumonia was exceptionally great for March. We find an increasing number of reports of diseases of the alimentary canal, although cholera infantum does not figure among them. Dysentery was quite noticeable in many localities, but of a mild type.

CHOLERA INFANTUM, where mentioned, was only reported in sporadic form.

DIARRHOEA AND DYSENTERY were reported of frequent occurrence in Bakersfield, Elinore, Fresno, Needles, Santa Paula, Hopland, Merced, Santa Rosa, College City, Sacramento, Visalia, Igo, Oakdale, Etna Mills, El Monte, Jackson, Los Angeles, Modesto, Marysville, San José, Eureka, and San Francisco.

VARICELLA, OR CHICKENPOX, reported in Sacramento and Mariposa.

MEASLES was reported as present in Sacramento, Redding, Vacaville, Lodi, Dixon, College City, Williams, Lockeford, Anaheim, Merced, Fresno, Sausalito, Alameda, Oakland, and San Francisco.

SCARLET FEVER in a mild form was observed in many places, among the number being Sacramento, Alturas, Stockton, Santa Cruz, Dixon, and San Francisco.

DIPHTHERIA AND CROUP still continue to be the scourge of young life, and claim as victims many of the healthiest children as well as the weakest. The direct cause remains still a mystery. After the most careful research, made by the local Government Board, in England, Dr. Buchanan, the Chief Medical Officer, says: "This disease has appeared to prevail under every variety of associated conditions. As usual, it has been accompanied, or its outbreak has been preceded by, abundant cases of apparently innocent sore throat. Neither has the approximate cause of diphtheria become any more apparent from the various bacteriological investigations that have been made," although all observers agree that the disease is owing to a bacillus, the identity of which is yet undiscovered. It is also agreed that its growth is favored in the presence of dampness and the absence of light, and that dryness, sunlight, and cleanliness are inimical to it. The view is also gaining ground that the disease is local before becoming general. If this conception is established it magnifies the importance of using disinfectant gargles and washes, and the absolute necessity of isolation, with strict cleanliness, accurate disinfection, with early and skilled treatment, if we would hope to limit or prevent the disease. Professor Löffler declares it as his opinion that the disease affecting pigeons, calves, pigs, turkeys, etc.,

which resembles diphtheria, is not caused by the bacillus of human diphtheria, and that those diseases in the lower animals are therefore not to be feared as sources of the human affection. Klein, however, believes that etiologically they are the same, and should be looked upon as transmissible to man, and therefore it would be prudent to keep such animals away from the dwelling place during the prevalence of any such sickness.

Whooping-Cough prevailed quite extensively in Sacramento, San Francisco, Oakland, Salinas, Downieville, Etna Mills, Middletown, and Alameda.

ERYSIPELAS was reported in sporadic form in Sacramento, Anderson, Brownsville, Bakersfield, Benicia, Santa Cruz, Downey, Mariposa, Merced, Etna Mills, Pleasanton, Fresno, Eureka, Modesto, Anaheim, and San Francisco.

TYPHOID FEVER.—A very few cases of this disease were reported as observed in Bakersfield, Merced, Etna Mills, Newcastle, San José, Sacramento, Los Angeles, and San Francisco.

TYPHO-MALARIAL FEVER was reported in Redding, Igo, Cottonwood, Merced, and Mariposa.

REMITTENT FEVER was observed in Redding, Needles, Lockeford, Knights Ferry, Fresno, and Visalia.

CEREBRAL FEVER.—Some isolated cases were reported in Sacramento, College City, Redding, Alameda, Gridley, Pomona, Watsonville, and San Diego.

PNEUMONIA was reported in every notice received, which exhibits its great prevalence. Following so large a proportion of cases of la grippe, it tends to show that there is some sort of connection between the two. Although the microphyte of pneumonia has apparently been identified, it is not yet placed beyond doubt, as if it were we must necessarily be obliged to place pneumonia among the communicable diseases. Several facts, however, contribute to this view, and even well-marked cases were noticed that seemed to be derived from others in close proximity.

BRONCHITIS prevailed extensively the past month throughout the State.

INFLUENZA, OR LA GRIPPE, continued in an epidemic form during the month. It is now on the wane, and probably by the next report issued it will have disappeared from the State. One of the most noticeable features of the epidemic was the predominance of the nervous symptoms. These were manifested by the violent headache, the pain down the spine, with oftentimes sensitiveness of the skin, making it painful to the touch, the mental depression, the tendency to faintness, which often preceded the attack, with the utter prostration following it, indicated the profound impression the poison exerted on the nerve centers.

THE STATE BOARD OF HEALTH.

The present Board having been superseded in office, with this issue of the "Monthly Circular" the connection of the present Secretary with it ceases. Hereafter his successor in office, when elected, will, it is to be hoped, improve and continue it for the information of the public and the instruction of those who are interested (as all should be) in the sanitary welfare of the State. Under the auspices of the deposed Board, sanitation in California was making a well-marked advance, and inducing a public interest in the matter which will yet bear fruit abundantly if it is sedulously cultivated. The Board has now had local Boards of Health organized and Health Officers appointed throughout the State; has enlisted a corps of sanitary correspondents who most diligently, and without monetary consideration, have kept the Secretary advised every month of the health of their different localities, and of the prevailing diseases existing, so that at any time the Secretary was in a position to take immediate action in the suppression of a threatened epidemic or the prevention of the advance of pestilential disease. The Board has also been successful in having Congress establish quarantine stations to protect our coast from imported disease. The one in San Francisco harbor, when completed, will be the most perfect in America, and will only be equaled by the one now in progress of erection in San Diego.

In taking leave of the public, the Board is desirous of acknowledging its obligation to the medical profession, the public press, and the railroads for the many favors extended to it, and would bespeak for its successors like courtesies from its many correspondents, upon whose kindness so much depends. Public health or sanitary efforts are not subjects to be controlled by or mixed with political prejudices or party strife. Sanitary science, being governed by natural law and not by politics, experience teaches us that neither disease nor death will be controlled by party dictation, or even arrested by party faith without sanitary works. Contagious diseases do not consult the political proclivities of their victims before invading the sanctity of their dwellings.

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NOTE.—Population of towns marked with an asterisk are from official census, 1890. †Including towns reporting no deaths, of an aggregate population of 9,100.

APRIL, 1891.

RECOMMENDATIONS OF THE STATE BOARD OF HEALTH.

The State Board of Health, on the 10th of April, instructed the Secretary to announce to local Boards and correspondents generally that vague terms, such as heart failure, dropsy, colds, and childbirth, given in some monthly reports as causes of death, will be regarded as neither sufficient nor satisfactory; and to recommend that specific terms, having the sanction of usage, and recognized in medical nomenclature, be invariably used to designate the cause of death. The wisdom of such recommendation is obvious to intelligent minds. The objects to be attained are precision and accuracy.

The Secretary was also instructed to obtain the census of 1890 for all the cities and towns of importance in California, and to compute percentages of deaths from such corrected estimates of population. This number shows this to have been only partially done, but the next will show a full compliance with these instructions.

To Correspondents.—It is hoped that correspondents who have hitherto furnished reports to the State Board of Health will continue to do so.

It is not desirable to make changes unless the cause is imperative. Should, however, some be unable to continue this work, which is essentially in the cause of humanity, it would be well to send a notification to that effect, so that others may be secured. Such notification will admit of no delay. If, therefore, localities that have heretofore sent regular reports, fail to send either a report for May, or a notification of inability to continue, it will be taken as an intimation that the Board will be at liberty to invite another correspondent.

It is extremely desirable that all reports should be forwarded at the earliest possible date after the end of each month. It is unnecessary to add that the members of the Board, and especially the Secretary, will appreciate fully the efforts of those who give their time and services to this cause. He desires their good will and support in the interest of sanitation in California.

REMARKS.

Mortality reports from 67 cities, towns, and localities, having a population of 674,830, show 1,064 deaths to have occurred from all causes. This is a percentage of 1.57 per 1,000 per month, or 18.84 per 1,000 per annum.

Consumption was the cause in 164 cases, pneumonia in 153, bronchitis in 40, and congestion of the lungs in 8. Diarrhoea and dysentery are assigned as the cause of 7 deaths, cholera infantum 3, and of other diseases of the stomach and bowels 51. Croup caused 21 deaths, scarlatina but 1, whooping-cough 3, typhoid fever 14, malarial fevers 3, cerebro-spinal fevers 6, cancer 29, erysipelas 1, heart disease 63, alcoholism 13, and all other causes, not necessarily classified, 436. Of this last number la grippe is responsible for 13 deaths, and there is a reasonable presumption that many fatal cases of lung disease are traceable directly to an attack of that disease. Diphtheria caused death in 48 cases, San Francisco furnishing 27. This disease is undoubtedly communicated by germ contagion or infection, but the principal influences contributing to its virulence and fatality are those unsanitary conditions arising from soil pollution, bad drainage, with resulting vitiated air and impure water. It follows, then, that efforts to reduce the numerical quantity and lessen the fatality of this disease should consist in the construction of good sewers and good drains, the removal of all offensive matter, the obliteration of stagnant water, and the annihilation of filth. Diarrhoea is given as the cause of 9 deaths. Localities having a large number of cases of la grippe show also an increase in diarrhoea; the city of Fresno, for example, reporting 33 cases of la grippe and 18 of diarrhoea. The general catarrhal condition of all the mucous surfaces in the former diseases is a sufficient explanation of the accompanying diarrhoea.

PREVAILING DISEASES.

MEASLES was reported from Middletown, Anderson, Downieville, Dixon, Etna Mills, San Pedro, Santa Paula, Truckee, Anaheim, College City, Red Bluff, Fresno, and Sacramento.

WHOOPIING-COUGH has been in Sacramento, Fresno, Vacaville, Downieville, and Oakdale.

LA GRIPPE.—The only disease that may be said to prevail extensively is la grippe, 363 cases being reported from different parts of the State, with an accredited fatality of 13. Fresno reported 33 cases, with 31 of bronchitis and 5 of pneumonia. Red Bluff 50, with 5 of bronchitis and 10 of pneumonia. Lincoln 10, with 1 of bronchitis. College City, 16, with 7 of bronchitis and 4 of pneumonia. Pleasanton 20, with 20 of bronchitis and 2 of pneumonia. Elsinore reported 15 cases, Alturas 13, Vacaville 10, with 8 of bronchitis and one of pneumonia. Eureka 5, with 10 of bronchitis and 2 of pneumonia. Anderson had 40 cases, Middletown 11, Oakdale 4, Calico 10, Knights Ferry 8, Gridley, 10, Needles 20, National City 6, Etna Mills 15, Santa Paula 3, Benicia 6, and Truckee 60 cases. San Francisco, Los Angeles, San Diego, and other southern points of importance report none at all. Oakland, Alameda, and San José are almost, if not altogether, exempt. The progress of this remarkable malady has been somewhat erratic, following no well-defined course, and requiring no unusual local conditions for its development. It is unnecessary to predict its future in California. If the prevalence of moisture in some portions of the State during April is responsible for the extension of its visit, it would seem to follow that San Francisco, which had heavier rainfalls than for years before in April, should have had la grippe. Such, however, was not the case, none being

reported. The southern portion of the State has not been entirely exempt. Needles and Calico are in a region rated by the Signal Office as below normal in rainfall for April, but yet they have suffered severely from la grippe. In these instances moisture cannot have been the cause.

An abstract from the Signal Service report by Lieut. John P. Finley, U. S. A., for April, is appended, to give those who may be interested in following this subject an opportunity to estimate the value of rainfall and temperature in favoring or limiting the prevalence of this unique visitation:

The rainfall has been in excess of the normal in Northern California, western Oregon, and western Washington. Elsewhere there has been a deficiency. The excess varies from .05 of an inch at Sacramento to 3.31 inches at Eureka. The deficiency ranges from .04 of an inch at Los Angeles to 1.14 inches at Fresno. The heaviest monthly rainfall was 7.80 inches at Fort Canby, and the smallest .10 of an inch at Keeler. No rain fell at Yuma and Fort Grant, which fact marks an unusual deficiency for Arizona. The rainfall at San Francisco was 2.44 inches, or .40 of an inch above the normal. This is one of the heaviest rainfalls at San Francisco for a number of years during April. The other dates of heavy rainfall are as follows: 1853, 5.37; 1855, 5.00; 1860, 3.14; 1880, 10.06; 1884, 6.33; 1886, 5.28.

TEMPERATURE.—The temperature has been in excess of the normal in all districts, except the central portion of California, where the deficiency ranges from 3° at Keeler to 4° at Sacramento. It remained normal at San Francisco and Eureka. The excess ranges from 8° at Roseburg, and 6° at Yuma, to 1° at San Diego, Fort Canby, and Olympia. The highest temperature, 102°, occurred at Yuma on the 28th, and 100° on the 27th. The lowest temperature, 20°, occurred at Baker City, Oregon, on the 2d. Light frosts occurred in Northern California on the 8th, 11th, and 26th; in Oregon on the 2d, 3d, and 8th; in Nevada on the 11th, 19th, and 26th.

STATIONS.	RAINFALL.			TEMPERATURE.	
	April Rainfall.	Total Seasonal.	Normal April.	Average Monthly.	Normal April.
Red Bluff.....	2.30	20.51	2.18	53	56
Sacramento.....	2.00	15.00	1.95	52	56
San Francisco.....	2.44	16.22	2.04	53	53
Fresno.....	0.50	8.22	1.64	59	62
Keeler.....	0.10	4.36	0.64	57	60
Los Angeles.....	1.30	13.08	1.34	59	54
San Diego.....	0.80	10.02	0.90	58	57
Yuma.....	0.00	6.22	0.11	70	64
Fort Grant.....	0.00	17.86	0.60	59	-----

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MAY, 1891.

Reports from 66 cities, towns, and villages, having an aggregate population of 608,945, show a mortality of 945 from all causes. This is a percentage of 1.55 per 1,000 for May, or 18.60 per 1,000 per annum.

Consumption was fatal in 140 cases, being a reduction of 24 since April. Pneumonia was the cause of death in 91, bronchitis in 21, and congestion of the lungs in 11. There were 15 deaths from diarrhea and dysentery, 8 from cholera infantum, and 34 from other diseases of the stomach and bowels. Diphtheria caused 33 deaths, croup 13, scarlatina 2, measles 3, and whooping-cough 8. Typho-malarial fever is credited with 3 deaths, typhoid fever with 20, remittent and intermittent fevers 7, and cerebro-spinal fever 3. Cancer caused 24, erysipelas 3, heart diseases 58, alcoholism 8, and all other causes 420.

PREVAILING DISEASES.

CHOLERA INFANTUM was reported at Fresno, San Pedro, Lone, Santa Paula, and Cottonwood.

DIARRHEA has been quite prevalent, Willows reporting 12 cases, Modesto 111. It prevailed also at Lone, Etna Mills, Oakdale, Eureka, Lincoln, Bakersfield, Pleasanton, Santa Paula with 11, Vacaville, Middletown, San Pedro, Mariposa, College City, Red Bluff, and Fresno with 75 cases.

CHOLERA MORBUS was reported from Fresno, Modesto, Red Bluff, College City, Benicia, San Pedro, Pleasanton, Galt, Wheatland, and Williams.

DYSENTERY was reported from Williams, Lone, Downey, Gridley, Vacaville, San Pedro, Red Bluff, Modesto, and Fresno with 42 cases.

SMALLPOX has not been reported, but there is one case in the Sacramento City and County Pesthouse. It is believed to have been contracted at El Paso, Texas. Sufficient time has not elapsed to determine if the contagion is to spread. There are also cases of this disease at the United States Quarantine Station, near San Francisco, all of which are recovering.

MEASLES appears to be epidemic in Lone, 100 cases being reported. There were 10 at Red Bluff, 42 at Fresno, 11 at Wheatland, 20 at Oakdale, 16 at Bakersfield. It was also reported from Santa Paula, Truckee, Dixon, Vacaville, Mariposa, Lincoln, Etna Mills, Galt, and Sacramento.

SCARLATINA was reported from Ventura, Vacaville, Napa, Bakersfield, Oakdale, Lone, Modesto, and Sacramento.

DIPHTHERIA was reported from Modesto, St. Helena, Dixon, Truckee, College City, Eureka, and Napa.

FEVERS OF A MALARIAL TYPE have prevailed in Mariposa, Lincoln, Vacaville, Cottonwood, Sausalito, Pleasanton, Truckee, Gridley, San Pedro, Bakersfield, Lone, Red Bluff, Fresno, Wheatland, Oakdale, Etna Mills, Galt, and Williams.

TYPHOID FEVER has not prevailed to any great degree throughout the State. It is confined principally to the larger towns and cities.

DISEASES OF THE RESPIRATORY ORGANS coming under the head of pneumonia, bronchitis, and congestion of the lungs, have abated somewhat; but 133 deaths from these causes, exclusive of consumption, show that they prevail.

Three hundred and five cases of la grippe have been reported from 27 localities quite widely distributed.

San Francisco, Oakland, Los Angeles, San José, San Diego, Alameda, and Sacramento do not report prevailing diseases, the above reports being furnished from other sources.

The population is given according to the latest Census Report as published by Bancroft & Co., of San Francisco. It makes, in many instances, a material difference from former figures, but the discrepancy is explained when it is understood that many reports are taken from a wide area of territory covering many miles and attributed to one small town and vicinity. If, however, it is shown that any injustice is being done, a correction will at once be made.

Abstract of the Reports of Deaths and their Causes in California during May, 1891.

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ABSTRACT FOR MAY, 1891—Continued.

LOCATIONS AND AUTHORITIES.																	Totals
	Other Causes	Alcoholism	Heart Diseases	Erysipelas	Cancer	Cerebro - Spinal Fevers	Remittent and Intermittent Fevers	Typhoid Fever	Typho - Malarial Fever	Whooping-Cough	Smallpox	Measles	Scarlet Fever	Croup	Diphtheria	Other Diseases of St'mach & Bow'ls	
Pasadena and vic., Dr. Henry H. Sherk.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7,000
Petaluma and vicinity, Dr. L. H. Patty.	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	8,000
Pleasanton, Dr. W. H. Cope	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	842
Red Bluff and vicinity, Dr. J. M. West	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,000
Redding, Dr. F. P. Mitchell	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,861
Rio Vista, Dr. S. C. Brown	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,900
Selma and vicinity, Dr. E. E. Brown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,000
San Diego, Dr. Thos. L. Magce.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	16,150
San Francisco, Dr. J. W. Keeney	10	0	1	0	15	2	5	9	0	4	0	1	1	8	18	34	297,990
San José, Dr. J. R. Currow	231	6	26	3	1	0	0	0	0	0	0	0	0	0	0	0	18,027
San Luis Obispo, County Recorder	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,004
Santa Paula and vic., Dr. D. W. Mott	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,000
San Pedro, Dr. R. W. Hill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,000
Santa Monica, Dr. E. E. Folsom	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,700
Santa Barbara, Dr. R. F. Winchester	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,864
Santa Cruz, Dr. C. L. Anderson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,594
Santa Rosa, Dr. J. S. Sargent	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	5,216
Suisun and vic., Dr. J. W. B. Reynolds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2,000
St. Helena and vic., Dr. W. J. G. Dawson	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2,800
Truckee and vicinity, Dr. W. C. Cullers	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,300
Upper Lake, Dr. R. G. Reynolds	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	300
Vallejo, Dr. W. D. Anderson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,904
Ventura and vic., Dr. N. J. Comstock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	7,000
Watsonville, Dr. W. D. Rodgers	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,153
Wheatland and vicinity, Dr. S. Melton	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	600
Williams, Dr. A. W. Kimball	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
Totals	945	8	58	3	24	3	7	20	3	8	0	3	2	13	33	54	608,945*

*Including the following towns reporting no deaths: Cottonwood, Cloverdale, Downsville, Elsinore, Long Beach, Santa Maria, Vacaville, and Elmira.

JUNE, 1891.

Mortality reports from 75 cities, towns, and localities, aggregating a population of 675,954, show a total of 995 deaths from all causes. This is a percentage of 1.47 per 1,000 for June, or 17.64 per 1,000 per annum.

There were 140 deaths from consumption, 59 from pneumonia, 29 from bronchitis, 13 from congestion of the lungs, 18 from diarrhoea and dysentery, 24 from cholera infantum, 54 from other diseases of the stomach and bowels, 47 from diphtheria, 7 from croup, 7 from scarlatina, 2 from measles, 11 from whooping-cough, 1 from malarial fever, 23 from typhoid fever, 6 from cerebro-spinal fever, 32 from cancer, 1 from erysipelas, 78 from heart disease, 15 from alcoholism, and 428 from all other causes.

But few deaths have been reported as due to excessive heat, yet a sufficient number of cases of sunstroke have been noted during the few days of the heated term to dispel forever, it is hoped, the traditional fiction that insolation never occurs in California.

A reference to the mortality table will demonstrate an increase of deaths at San Francisco from diphtheria, there being 25 reported, as against 18 in May. It is remarkable that so much indifference should be shown to the ravages of a disease that is as surely preventable as smallpox. Every one will concede that 25 deaths from either cholera or smallpox would produce the utmost consternation in San Francisco. Nevertheless, 25 deaths from diphtheria, confined to those of tender years, seems to produce but little effect on those who have the control of ways and means with which to construct drains and sewers suitable to the urgent needs of a rich and populous city. Perhaps if these fatalities were confined to the voting class, a political thrill might find its tortuous way up the metropolitan spinal marrow, and for a time lead to the consideration of public morals in the way of municipal cleanliness. The same will apply to any other town or city.

PREVAILING DISEASES.

Reports of prevailing diseases from 47 localities show diseases of the stomach and bowels of a diarrhoeal character to have been quite common. There were 218 of simple diarrhoea, 27 of cholera infantum, 90 of cholera morbus, and 40 of dysentery. The fatalities have been light, considering the high temperature of the month. Thirty-three cases of measles, 33 of diphtheria, 3 of croup, 20 of erysipelas, 26 of typhoid fever, 275 of malarial fevers, 20 of pneumonia, 103 of bronchitis, 109 of la grippe, and 109 of whooping-cough, comprise the remainder. This would indicate that fevers of a malarial type were more prevalent than any other class of disease. This is easily explained by the late rains, creating surface water, followed by great heat. La grippe is diminishing, yet a considerable number of cases of bronchitis are attributable to this cause. The State, sanitarily considered, is in a healthy condition, and due vigilance should be observed in order to keep it so during the two months of warm weather before us.

Abstract of the Reports of Deaths and their Causes in California during June, 1891.

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JULY, 1891.

Mortality reports from 66 cities, towns, and villages, aggregating a population of 695,866, show 1,096 deaths from all causes. This is a percentage of 1.57 per 1,000 for July, or 18.84 per annum.

There were 141 due to consumption, 45 to pneumonia, 12 to bronchitis, 5 to congestion of the lungs, 16 to diarrhoea and dysentery, 62 to cholera infantum, 89 to other diseases of the stomach and bowels, 34 to diphtheria, 10 to croup, 5 to scarlatina, 7 to measles, 5 to whooping-cough, 5 to typho-malarial fevers, 38 to typhoid fever, 2 to remittent and intermittent fevers, 10 to cerebro-spinal fever, 45 to cancer, 89 to heart disease, 12 to alcoholism, and 473 to other causes.

There were 45 deaths from pneumonia as against 59 in June; 12 from bronchitis as against 29 in June; and 5 from congestion of the lungs as against 13 in June. This shows a marked decrease in acute diseases of the respiratory organs.

There were 38 deaths from typhoid fever, and 5 from typho-malarial fevers, as against 23 in June.

There were reported only 34 deaths from diphtheria as against 47 in June.

PREVAILING DISEASES.

Reports of diseases prevailing in 45 localities outside of cities and large towns show 39 cases of cholera infantum, 148 of diarrhoea, 42 of cholera morbus, 43 of dysentery, 43 of measles, 16 of scarlatina, 19 of diphtheria, 80 of whooping-cough, 25 of erysipelas, 26 of typhoid fever, 321 of malarial fevers, 5 of cerebral fevers, 3 of pneumonia, 45 of bronchitis, 7 of congestion of the lungs, 25 of influenza, and 7 of acute rheumatism.

Measles prevailed extensively at Middletown, Bakersfield, and Mariposa.

Red Bluff reported 25 cases of whooping-cough, and College City 18 cases.

Chico reported 14 cases of diphtheria.

Scarlatina has been reported from a number of places, always as in a mild form.

YELLOW FEVER.

The San Francisco "Chronicle" a few days ago published the following:

"*Yellow Fever at Guaymas.*—A letter received in this city by a business house, dated at Nogales, July 30th, states that the yellow fever prevails at Guaymas. There were 7 or 8 deaths a day during the week which preceded the writing of the letter. The informant adds that great efforts are being made to conceal the presence of the disease from the outside world, and that fines are threatened against any one in Guaymas who shall give information regarding the state of affairs."

A reply to a telegram to the "Chronicle" said: "Information authentic; it came in a letter to a merchant here, but we are not at liberty to give his name."

A telegram wired to Guaymas brought the following reply, dated August 7th: "No yellow fever at Guaymas or on the west coast of Mexico. A. Willard, U. S. Consul at Guaymas."

It is not improbable that the "Chronicle's" informant mistook dengue or some low form of malarial fever for yellow fever. It is scarcely probable that Consul Willard is mistaken; neither is it likely that the authorities influenced the telegraph companies to distort his message. Until further report is had to the contrary, it must be held that yellow fever does not prevail in Guaymas, and that we are not at this time in danger of invasion from that direction.

I believe it is generally admitted that a mean temperature above 70° F., with an abundance of moisture in the atmosphere, is necessary for the propagation of yellow fever.

There is some doubt about the hot valleys of the State possessing these conditions. It would not be wise, however, to permit the experiment, and the utmost vigilance will be observed during the remainder of the summer.

The health of the State is, generally speaking, very good; no epidemic prevails.

A preventive disease circular, entitled "Diphtheria; Its Restriction and Prevention," has been published by authority of the State Board of Health, and is intended for general distribution among the people. It will be sent, in numbers required, upon application to the Secretary of the Board at Sacramento.

Abstract of the Reports of Deaths and their Causes in California during July, 1891.

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LOCATIONS AND AUTHORITIES.																										
	Other Causes	Alcoholism	Heart Diseases	Erysipelas	Cancer	Cerebro-Spinal Fevers	Remittent and Intermittent Fevers	Typhoid Fever	Typho-Malarial Fever	Whooping-Cough	Smallpox	Measles	Scarlet Fever	Croup	Diphtheria	Other Diseases of St'mach & Bow'ls	Cholera Infantum	Diarrhoea and Dysentery	Congestion of the Lungs	Acute Bronchitis	Acute Pneumonia	Consumption	Total Deaths	Estimated Population		
Oroville, Dr. J. H. M. Karsner	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2,000		
Pasadena and vic, Dr. Henry Sherk	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	8	7,000		
Petaluma and vicinity, Dr. L. H. Patty	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	6	8,000		
Pomona and vicinity, Dr. R. F. Rose	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	5,000		
Red Bluff and vicinity, Dr. J. M. West	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5,000		
Redding and vicinity, Dr. F. P. Mitchell	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3,000		
Rio Vista and vicinity, Dr. S. C. Brown	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1,900		
Rocklin, Dr. A. M. Stafford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	800		
Sacramento, Dr. C. B. Nichols	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	26,272		
San Diego, Dr. Thomas L. Magee	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9	16,150		
San Francisco, Dr. J. W. Keeney	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	580	330,000		
San José, Dr. J. R. Curnow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	52	18,027		
San Luis Obispo, County Recorder	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	12	3,004		
San Pedro, Dr. R. W. Hill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	7,000		
Santa Monica, Dr. M. Thornburg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	11	1,700		
Santa Ana and vicinity, Dr. J. G. Bailey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	7	10,900		
Santa Barbara, Dr. R. F. Winchester	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	5,864		
Santa Paula and vicinity, Dr. D. W. Moff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	2,000		
Santa Cruz, Dr. C. L. Anderson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	5,594		
Santa Rosa, Dr. R. P. Smith	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7	5,216		
Stockton, Dr. C. A. Ruggles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	31	14,376		
Suisun, Dr. J. W. B. Reynolds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1,000		
Truckee and vicinity, Dr. W. Curless	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	1,300		
Upper Lake, Dr. R. G. Reynolds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	300		
Vallejo, Dr. W. D. Anderson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	5,904		
Ventura and vic, Dr. A. J. Constock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	8	7,000		
Vacaville and Elmira, Dr. J. W. Stitt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	4,500		
Watsonville, Dr. W. D. Rodgers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2,500		
Williams, Dr. A. W. Kimball	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	600		
Totals	1,096	12	80	0	45	10	2	38	5	5	0	7	5	10	34	89	62	16	5	12	45	141	1,096	695,866		

AUGUST, 1891.

Mortality reports from 66 cities, towns, and localities, aggregating a population of 706,054, show the total number of deaths in August, from all causes, to have been 975. That is 1.38 per cent per 1,000 for the month, and 16.56 per cent for the year.

There were 122 due to consumption, 52 to pneumonia, 19 to bronchitis, 15 to congestion of the lungs, 19 to diarrhoea and dysentery, 48 to cholera infantum, 59 to other diseases of the stomach and bowels, 25 to diphtheria, 6 to croup, 2 to scarlatina, 3 to measles, 7 to whooping-cough, 37 to typhoid fever, 3 to malarial fevers, 5 to cerebro-spinal fever, 30 to cancer, 3 to erysipelas, 85 to heart disease, 8 to alcoholism, and 430 to all other causes.

PREVAILING DISEASES.

Reports from 53 localities show 49 cases of cholera infantum, 155 of diarrhoea, 65 of cholera morbus, and 37 of dysentery.

Measles was reported from Middletown, Santa Cruz, Dixon, Fresno, and Mariposa.

Scarlatina was reported from 2 places only, St. Helena and Rio Vista. It has prevailed also in Sacramento during August.

Diphtheria has been reported from Alvarado as epidemic. Truckee reported 15 cases, Pomona 6. Willows has had 43 cases, but none have been reported, owing to the absence of the Health Officer.

Whooping-cough is scattered quite generally over the State. There were 25 cases in Pomona, 10 in Downey, 4 in Fresno, 20 in Lockeford, 8 in Red Bluff, 12 in Galt, and was heard from at Santa Rosa and San Diego. Ninety-four cases were reported in all. It was reported as epidemic at Elk Grove.

Seventeen cases of erysipelas were reported, 52 of typhoid fever, 368 of malarial fevers, 3 of cerebro-spinal fever, 5 of pneumonia, 7 of congestion of the lungs, 63 of bronchitis, 24 of influenza, and 6 of rheumatism.

Abstract of the Reports of Deaths and their Causes in California during August, 1891.

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Mariposa, Dr. W. J. Kearney	425	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monterey, Dr. Sidney H. Smith	1,200	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Napa, Dr. M. B. Pond	4,387	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Needles, Dr. James P. Booth	325	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oakland, Dr. J. P. H. Dunn	50,000	67	7	4	2	0	0	5	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pasadena and vicinity, Dr. Henry Sherck	10,000	9	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pleasanton and vicinity, Dr. W. H. Cope	800	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pomona and vicinity, Dr. R. F. Rose	5,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Bluff and vicinity, Dr. J. M. West	5,000	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Redding, Dr. F. P. Mitchell	1,861	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rio Vista and vicinity, Dr. S. C. Brown	1,900	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sacramento, Dr. C. B. Nichols	26,272	27	3	1	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
San Bernardino, Dr. C. C. Wainwright	3,000	11	2	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Diego, Dr. Thos. L. Magee	21,000	11	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Francisco, Dr. J. W. Keeney	330,000	550	66	38	14	14	14	25	32	13	6	1	3	0	2	0	17	0	0	19	2	55	4	225
San José, Dr. J. R. Curnow	18,027	34	5	0	0	0	1	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Luis Obispo, County Recorder	3,004	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Monica, Dr. E. C. Folsom	1,700	4	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Paula and vicinity, Dr. D. W. Mott	2,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Ana and vicinity, Dr. J. S. Bailey	15,000	6	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Barbara, Dr. R. K. Winchester	5,864	12	2	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Cruz, Dr. C. L. Anderson	5,594	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Rosa, Dr. R. P. Smith	5,216	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sausalito and vic., Dr. H. J. Crumpton	2,000	3	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stockton, Dr. C. A. Ruggles	14,376	25	4	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
St. Helena and vic, Dr. J. G. Dawson	2,200	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Soquel, Dr. H. O. Brink	300	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tulare City, Dr. C. F. Taggart	3,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Upper Lake, Dr. R. G. Reynolds	300	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vallejo, Dr. W. D. Anderson	5,904	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vacaville and Elmira, Dr. J. W. Stitt	4,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Watsonville, Dr. W. D. Rodgers	4,500	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Woodbridge and vicinity, Dr. S. E. Lotta	1,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	706,054	975	122	52	19	15	19	48	59	25	6	2	3	0	7	4	33	3	5	30	3	32	8	430

SEPTEMBER, 1891.

Mortality reports from 63 cities, towns, villages, and localities, having an aggregate population of 675,551, show the total number of deaths from all causes in September to have been 929, making a death rate per 1,000 of 16.44 per annum.

Consumption was the cause of death in 129 cases, pneumonia in 38, bronchitis 13, congestion of the lungs 3, diarrhœa and dysentery in 30, cholera infantum in 30, other diseases of the stomach and bowels 63, diphtheria 33, membranous croup 10, whooping-cough 6, typhoid fever 28, malarial fevers 7, cerebro-spinal fever 3, cancer 20, erysipelas 3, heart disease 73, alcoholism 8, and from all other causes 444.

PREVAILING DISEASES.

Reports from 55 localities give 30 cases of cholera infantum, 168 of diarrhœa, 47 of cholera morbus, 41 of dysentery, 29 of measles, 10 of scarlatina, 26 of diphtheria, 18 of membranous croup, 31 of whooping-cough, 12 of erysipelas, 39 of typhoid fever, 379 of malarial fevers, 2 of cerebral fever, 11 of pneumonia, 62 of bronchitis, 9 of congestion of the lungs, 42 of influenza, and 5 of rheumatism.

In the foregoing typho-malarial fever is classed as typhoid fever, and intermittent and remittent fevers as malarial fevers.

Abstract of the Reports of Deaths and their Causes in California during September, 1891.

[illegible]

ABSTRACT FOR SEPTEMBER, 1891—Continued.

Other Causes	0	3	1	2	1	0	19	4	5	21	3	0	9	3	6	1	1	1	3	3	2	2	0	9	0	0	1	444			
Alcoholism.....	0	0	0	0	0	0	0	1	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8			
Heart Diseases	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73			
Erysipelas.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3			
Cancer	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20			
Cerebro - Spinal Fevers.....	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3			
Remittent and Intermittent Fevers	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7			
Typhoid Fever.....	0	0	0	0	0	1	1	0	0	9	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	23			
Typho - Malarial Fever.....	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5			
Whooping-Cough.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6			
Smallpox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Measles.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Scarlet Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Croup.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10			
Diphtheria	0	0	0	0	0	0	1	0	0	18	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33			
Other Diseases of St'mach & Bow'ls	1	0	0	1	0	0	2	0	0	47	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63			
Cholera Infantum.....	0	0	0	1	0	0	0	0	0	15	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30			
Diarrhoea and Dysentery	0	0	0	0	0	0	0	0	0	6	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18			
Congestion of the Lungs	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3			
Acute Bronchitis.....	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13			
Acute Pneumonia.....	0	0	0	0	0	0	1	0	0	27	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38			
Consumption	1	1	0	0	0	0	5	1	0	60	3	9	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	129			
Total Deaths	2	6	4	2	2	33	8	0	11	465	37	60	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	929			
Estimated Population	800	5,000	5,000	5,000	1,900	26,272	3,000	16,153	300,000	18,027	3,004	2,000	1,500	15,000	5,684	5,594	1,000	5,216	2,000	3,000	14,376	2,800	2,000	1,300	3,000	300	5,500	4,500	2,000	1,000	675,551
LOCATIONS AND AUTHORITIES.	Pleasanton, Dr. W. H. Cope Pomona and vicinity, Dr. R. F. Rose Red Bluff and vicinity, Dr. J. M. West Redding and vicinity, Dr. F. P. Mitchell Rio Vista and vicinity, Dr. S. C. Brown Sacramento, Dr. C. B. Nichols San Bernardino, Dr. C. C. Wainwright San Diego, Dr. Thos. L. Magee San Francisco, Dr. J. W. Keeney San José, Dr. J. R. Curnow San Luis Obispo, County Recorder Santa Paula and vic., Dr. D. W. Mott San Pedro and vicinity, Dr. R. W. Hill Santa Ana and vicinity, Dr. J. G. Bailey Santa Barbara, Dr. R. F. Winchester Santa Clara, Dr. C. L. Anderson Santa Maria, Dr. M. Thornburg Santa Rosa, Dr. R. P. Smith Sausalito and vic., Dr. H. J. Crumpton Selma and vicinity, Dr. E. E. Brown Stockton, Dr. C. A. Ruggles St. Helena and vic., Dr. J. G. Dawson Stinson and vic., Dr. J. W. B. Reynolds Truckee and vicinity, Dr. W. Carless Tulare City, Dr. C. F. Taggart Upper Lake, Dr. R. G. Reynolds Vallejo, Dr. W. D. Anderson Vacaville and Elmira, Dr. J. W. Stitt Watsonville, Dr. W. D. Rodgers Wheatland and vicinity, Dr. L. Melton Totals	800 5,000 5,000 5,000 1,900 26,272 3,000 16,153 300,000 18,027 3,004 2,000 1,500 15,000 5,684 5,594 1,000 5,216 2,000 3,000 14,376 2,800 2,000 1,300 3,000 300 5,500 4,500 2,000 1,000 675,551																													

OCTOBER, 1891.

Mortality reports from 71 cities, towns, villages, and localities, having an aggregate population of 700,563, show the total number of deaths from all causes in October to have been 1,077, making a death rate of 1.53 per 1,000 for the month, or 18.36 per 1,000 per annum.

Consumption was the cause in 158 cases, acute pneumonia in 67, acute bronchitis in 20, congestion of the lungs in 4, diarrhoea and dysentery in 22, cholera infantum in 36, other diseases of the stomach and bowels in 73, diphtheria in 46, croup in 15, scarlatina in 1, measles in 6, whooping-cough in 1, typhoid fever in 29, remittent and intermittent fevers in 4, cerebro-spinal fever in 7, cancer in 40, heart disease in 67, alcoholism in 10, and all other causes 471.

PREVAILING DISEASES.

Reports from 63 localities give 7 cases of cholera infantum, 139 of diarrhoea, 45 of dysentery, 31 of measles, 20 of scarlatina, 48 of diphtheria, 3 of croup, 33 of whooping-cough, 24 of erysipelas, 46 of typhoid fever, 272 of malarial fevers, 7 of cerebro-spinal fever, 30 of pneumonia, 83 of bronchitis, 4 of congestion of the lungs, and 66 of influenza.

Abstract of the Reports of Deaths and their Causes in California during October, 1891.

LOCATIONS AND AUTHORITIES.	Estimated Popula- tion	Total Deaths	Consumption	Acute Pneumonia.	Acute Bronchitis..	Congestion of the Lungs	Diarrhoea and Dys- entery	Cholera Infantum.	Other Diseases of St'mach & Bow'ls	Diphtheria	Croup	Scarlet Fever	Measles	Smallpox	Whooping-Cough..	Typho - Malarial Fever.....	Typhoid Fever	Remittent and In- termittent Fevers	Cerebro - Spinal Fevers	Cancer	Erysipelas	Heart Diseases	Alcoholism	Other Causes
Alturas, Dr. John M. Forrest	2,250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alameda, Dr. John T. McLean	11,900	10	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Anaheim and vicinity, Dr. J. H. Bullard	5,000	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Antioch and vicinity, Dr. W. S. George	1,000	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Auburn, Dr. A. S. Waldo	1,601	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Azusa and vicinity, Dr. J. H. Miller	2,000	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bakersfield and vicinity, Dr. C. A. Rogers	2,000	6	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Benicia and vicinity, Dr. Edward Gray	2,591	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Berkley, Dr. F. H. Payne	5,500	6	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Calico, Dr. A. R. Rhea	600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colton and vicinity, Dr. M. E. Price	2,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cottonwood and vicinity, Dr. J. O. Smith	1,200	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cloverdale, Dr. R. S. Markell	1,500	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chico and vicinity, Dr. William King	8,890	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dixon, Dr. A. Trafton	1,567	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Downville and vicinity, Dr. A. Jump	1,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Downey and vicinity, Dr. Q. J. Rowley	2,500	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Etna Mills, Dr. E. W. Bathurst	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
El Monte and vicinity, Dr. R. D. Adams	1,000	6	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eureka and vicinity, Dr. S. B. Gaston	10,000	14	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elsinore and vicinity, Dr. T. E. Ellis	800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Forest Hill and vicinity, Dr. Paul Reudy	3,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fresno, Dr. W. S. Naupin	10,796	15	2	0	2	0	0	1	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0
Folsom, Dr. B. F. Bates	1,960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Galt, Dr. Alex. Montague	700	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grass Valley and vicinity, Dr. Thomas	7,000	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gonzales, Dr. E. A. E. Hertel	350	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Haywards, Dr. G. E. Alexander	1,200	6	2	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jackson and vicinity, Dr. E. B. Roberts	2,600	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lockeford, Dr. E. N. Foote	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Long Beach and vicinity, Dr. J. W. Wood	2,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lodi and vicinity, Dr. E. A. Burchard	1,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Los Angeles, Dr. G. MacGowan	53,394	64	10	2	1	0	5	0	3	0	0	0	0	0	0	0	3	0	0	1	0	0	0	31

REPORT OF THE STATE BOARD OF HEALTH.

[illegible]

NOVEMBER, 1891.

Mortality reports from 109 cities, towns, villages, and localities, having an aggregate population of 739,577, show the total number of deaths from all causes in November to have been 1,060, making a death rate of 1.47 per 1,000 for the month, or 17.64 per 1,000 per annum.

There were 178 deaths due to consumption, 76 to acute pneumonia, 39 to acute bronchitis, 6 to congestion of the lungs, 18 to diarrhoea and dysentery, 14 to cholera infantum, 46 to other diseases of the stomach and bowels, 35 to diphtheria, 25 to croup, 5 to scarlatina, 2 to measles, 4 to whooping-cough, 37 to typhoid fever, 5 to malarial fevers, 4 to cerebro-spinal fever, 45 to cancer, 83 to heart disease, 12 to alcoholism, and 471 to all other causes.

PREVAILING DISEASES.

Reports from 97 localities outside of the large cities give 45 cases of cholera morbus, 26 of cholera infantum, 168 of diarrhoea, 69 of dysentery, 45 of measles, 63 of scarlatina, 30 of diphtheria, 11 of croup, 132 of whooping-cough, 25 of erysipelas, 2 of typhus fever, 86 of typhoid fever, 213 of malarial fevers, 3 of cerebro-spinal fever, 76 of rheumatism, 140 of pneumonia, 14 of pleurisy, 235 of bronchitis, 15 of congestion of the lungs, 6 of enteritis, 13 of nephritis, 115 of tonsillitis, 65 of neuralgia, and 449 of la grippe.

A mild type of scarlatina prevailed quite generally throughout the State, there being but five fatalities reported. Whooping-cough has been reported as epidemic in several localities. Diseases of the respiratory organs have been very numerous; also diseases of the stomach and bowels. These may, in the majority of cases, be attributed to the quite general prevalence of la grippe, 449 cases of which were reported. It was reported as epidemic in 15 localities where the number of cases was not given. It is reported as being very frequently associated with bronchitis and pneumonia. Rheumatism and neuralgia have been quite generally prevalent. No cases of smallpox have been known to exist in the State for several months, and the entire United States has been quite free from this dreaded malady during the year. The Province of Quebec has, however, had 135 cases, all arising from one person that started the contagion. During November it has been reported in New Jersey, Pennsylvania, Ohio, Tennessee, and Texas. It will doubtless be controlled as far as practicable, but all efforts in that direction have in the past proven of no avail where unvaccinated people have been exposed to the disease. It is quite as likely to leap across the continent as to leap from Quebec to Texas, and this likelihood should be a sufficient warning for those who are unprotected to be vaccinated without delay. There should be a more strict compliance with the law denying admittance to unvaccinated children in the public schools. This should be done without exciting unnecessary alarm, but the necessity for such action should be generally understood, and be insisted upon, especially in the schools.

EXTRACTS FROM WEATHER BUREAU REPORT.

TEMPERATURE.—The weather averaged warmer than usual in November in all districts west of the Rockies.

PRECIPITATION.—No appreciable precipitation fell at Los Angeles during November; San Diego had .10 of an inch; Fresno, .20; San Francisco, .60; Sacramento and Red Bluff, .50. Northern California, San Francisco, and Red Bluff, show deficiencies of 2.25 and 2.34, respectively.

Considering the seasonal falls to date the following deficiencies are computed: Red Bluff, 4.22 inches; San Francisco, 2.83; Sacramento, 2.18; Los Angeles 1.88; San Diego, 1.45.

DECEMBER PRECIPITATION ON THE PACIFIC SLOPE.—The section of California having the greatest amount of precipitation in December lies just west of the Sierra Nevada range and in the extreme northwest (northern Humboldt and Del Norte Counties); and that having the least lies north of the San Bernardino range, east of eastern Tulare and Kern Counties. The eastern half of San Diego County also usually receives less than an inch of rainfall during the month. Along the coast from Monterey Bay to San Diego there is a general average of 4 inches of rainfall, but north of Monterey Bay along the coast it averages from 5 to 8 inches, except off the point on Cape Mendocino, in Humboldt County, where it is slightly less than 4 inches.

Abstract of the Reports of Deaths and their Causes in California during November, 1891.

LOCATIONS AND AUTHORITIES.	Estimated Population	Total Deaths																									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Alameda, L. R. John M. Forrest	550	1																									
Alameda, Dr. John T. McLean	11,900	11																									
Anaheim and vic., Dr. J. H. Bullard	5,000	1	0																								
Anderson, Dr. L. J. Tabler	1,000	1	0																								
Auburn, Dr. A. S. Waldo	1,601	3	0																								
Bakersfield and vic., Dr. C. A. Rogers	3,300	6	0																								
Benicia and vic., Dr. Edward Gray	2,700	1	0																								
Calistoga and vic., Dr. F. W. Mitchell	2,000	1	0																								
Cedarville, Dr. A. Gibson	200																										
Colton and vicinity, Dr. M. F. Price	2,000	4	2																								
College City and vic., Dr. C. H. Gibbons	1,000																										
Colusa, Dr. S. A. Gray	1,332	2	0																								
Cottonwood and vic., Dr. J. O. Smith	1,200	0	0																								
Cloverdale, Dr. R. S. Markell	1,500	1	0																								
Chico and vicinity, Dr. William King	8,800	8	2																								
Davisville and vicinity, Dr. W. E. Bates	1,500	1	1																								
Dixon, Dr. Aug. Trafton	1,567	1	0																								
Downieville and vic., Dr. Alembly Jump	1,000	1	0																								
Downey and vicinity, Dr. Q. J. Rowley	2,500	7	0																								
Etna Mills, Dr. E. W. Rathurst	400	2	0																								
El Monte and vicinity, Dr. R. D. Adams	1,000	1	0																								
Elk Grove, Dr. J. A. McKee	200																										
Eureka and vicinity, Dr. S. B. Foster	10,000	7	1																								
Elsinore and vicinity, Dr. Thos. E. Ellis	1,000	1	0																								
Forest Hill and vic., Dr. Paul Feudy	3,000	0	0																								
Ft. Bidwell and vic., Dr. W. J. Wakenan	1,500																										
Fresno, Dr. W. F. Maupin	10,796	13	5																								
Galt, Dr. Alex. Montague	700	1	0																								
Grass Valley and vic., Dr. W. R. Thomas	7,000	6	1																								
Glendora, Dr. J. H. Miller	100	3	1																								
Gonzales, Dr. C. A. E. Hertel	350																										
Gridley, Dr. J. T. Harris	700	0	0																								
Haywards, Dr. G. E. Alexander	1,625	10	3																								

LOCATIONS AND AUTHORITIES.

[illegible]

DECEMBER, 1891.

Mortality reports from 115 cities, towns, villages, and localities, having an aggregate population of 796,518, show the number of deaths from all causes in December to have been 1,752, making a death rate of 2.19 per 1,000 for the month, or 26.28 per 1,000 per annum.

There were 235 deaths due to consumption, 340 to acute pneumonia, 100 to acute bronchitis, 31 to congestion of the lungs, 11 to diarrhoea and dysentery, 12 to cholera infantum, 59 to other diseases of the stomach and bowels, 58 to diphtheria, 14 to croup, 5 to scarlatina, 4 to measles, 2 to whooping-cough, 36 to typhoid fever, 4 to malarial fevers, 5 to cerebro-spinal fever, 30 to cancer, 2 to erysipelas, 113 to diseases of the heart, 17 to alcoholism, and 674 to all other causes. Of the deaths placed under other causes, la grippe is responsible directly for 49, and indirectly to the greatly increased mortality from respiratory diseases.

November reports showed 199 deaths from diseases of the lungs; December 706. There is also an increase in diphtheria over November, from 35 to 58. Deaths from croup dropped down from 25 in November to 14 in December. There is also a reduction of 5 in the number of deaths from typhoid fever. There is, however, a marked increase in deaths from diseases of the heart, 113 being reported in December against 83 in November. This has no doubt a relation to la grippe and diseases of the respiratory organs.

It would appear that if it were not the prevailing epidemic with its accompanying bronchitis, pneumonia, tonsilitis, and protean perturbing influences upon the human economy, the public health would be above the average.

PREVAILING DISEASES.

Reports from 105 towns, villages, and localities outside of the larger cities, give 8 cases of inflammation of the bowels, 5 of inflammation of the brain, 5 of cholera morbus, 17 of cholera infantum, 65 of diarrhoea, 22 of dysentery, 1 of smallpox, 74 of measles, 51 of scarlatina, 36 of diphtheria, 14 of croup, 1,791 of influenza, 50 of whooping-cough, 23 of erysipelas, 61 of typhoid fever, 139 of malarial fevers, 12 of cerebro-spinal fever, 74 of tonsilitis, 24 of inflammation of the kidneys, 20 of neuralgia, 12 of pleurisy, 244 of pneumonia, 42 of rheumatism, 293 of bronchitis, 15 of congestion of the lungs, and 43 of chickenpox.

Diseases of the stomach and bowels have decreased, and diseases of the respiratory organs have largely increased, with a corresponding increase in fatalities. La grippe is greatly responsible for this increase. In addition to the 1,791 cases of this disease enumerated by reporters, it is reported prevalent or epidemic, and associated in a greater or less degree with bronchitis, pneumonia, and tonsilitis, in Ione, Livermore, Alturas, Tulare, Cloverdale, St. Helena, Biggs, Anaheim, Monterey, Martinez, San Mateo, San Rafael, Santa Maria, Soquel, Santa Cruz, National City, Knights Ferry, Azusa, Watsonville, Gridley, Benicia, Downieville, Modesto, Jackson, Marysville, Halfmoon Bay, Stockton, Petaluma, Solano County, Healdsburg, Pasadena, Santa Rosa, Forest Hill, San Diego, Anaheim, Napa, Elk Grove, Ventura, Sebastopol, and Etna Mills. This is without taking into account San Francisco, Los Angeles, Oakland, Sacramento, and San José, where it has, by common report, prevailed quite as generally as it has among those reported from. This would run the number up into the thousands, and would account for the increased death rate from diseases of the lungs. The sequels of the epidemic will appear in the death rates of several future months under other names, but they will, nevertheless, follow as a result of la grippe. It is quite reasonable to presume that the height of intensity of the epidemic has been reached, and that it will subside from want of material to work upon. So large a percentage of the population having had the disease makes this supposition warrantable. But one case of smallpox is reported in the State, and that is in quarantine at the Sacramento Pesthouse. He came recently from the vicinity of Tulare to Sacramento. Those cases that occurred among the Chinese passengers on board ship from China to San Francisco have been, and still are, in quarantine near San Francisco. There appears to have been no spread of the disease from that source. Sacramento has for more than twenty-five years enjoyed the benefits of a State law requiring all children, before entering the public schools, to be vaccinated. The result has been that while other cities have suffered from the ravages of the pestilence, resulting in depression of business and interference with traffic, Sacramento has enjoyed comparative immunity. In no instance has the disease spread from the occasional isolated cases that have been discovered. The vaccination law is now in force in the entire State, and it is not too much to hope that the entire population may, before many years, be as fully protected as Sacramento.

EXTRACTS FROM WEATHER BUREAU REPORT.

The month can be classed as having been decidedly stormy and extreme in its conditions. The rains of the month were as follows: Red Bluff 3.8, Sacramento 3.3, San Francisco 5.6, Fresno 4.0, Los Angeles 2.0, San Diego 1.3. This is a deficiency of 1.4 inches in the Sacramento Valley, and from .9 to 1.5 in Southern California, but an excess of 1.7 at Fresno, and .5 at San Francisco. In California the mean temperature was 4° below normal, except on the coast, where it was from 1° to 2° below, and from 4° to 6° below in the interior. The warmest days were the 1st, 11th, 14th, and 15th, and the coldest were the 5th, 6th, 7th, 8th, 24th, 25th, and 26th.

Abstract of the Reports of Deaths and their Causes in California during December, 1891.

LOCATIONS AND AUTHORITIES.	Estimated Popula- tion	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26																									
		Other Causes	Alcoholism	Heart Diseases	Erysipelas	Cancer	Cerebro - Spinal Fevers	Remittent and Intermittent Fevers	Typhoid Fever	Typho - Malarial Fever	Whooping-Cough	Smallpox	Measles	Scarlet Fever	Croup	Diphtheria	Other Diseases of St'mach & Bow'ls	Cholera Infantum	Diarrhœa and Dysentery	Congestion of the Lungs	Acute Bronchitis	Acute Pneumonia	Consumption	Total Deaths			
Alturas, Dr. John M. Forrest.....	550	1	8	1	1	2	2	1	2	1	7	0	2	1	3	0	0	0	0	0	0	0	0	0	1		
Alameda, Dr. John T. McLean.....	11,900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15			
Alvarado, Dr. Albert Fouch.....	600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3			
Anaheim and vicinity, Dr. J. H. Bullard.....	5,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
Antioch and vicinity, Dr. W. S. George.....	3,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Auburn, Dr. A. S. Waldo.....	1,601	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Azusa and vicinity, Dr. J. H. Miller.....	2,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Bakersfield and vicinity, Dr. C. A. Rogers.....	3,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3			
Benicia and vicinity, Dr. Edward Gray.....	2,850	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Berkeley, Dr. F. H. Payne.....	5,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
Calistoga and vicinity, Dr. F. W. Mitchell.....	2,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
Colton and vicinity, Dr. M. F. Price.....	2,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
College City, Dr. C. H. Gibbons.....	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
Cloverdale, Dr. R. S. Markell.....	1,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2			
Davisville and vicinity, Dr. W. E. Bates.....	1,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
Dixon and vicinity, Dr. Aug. Trafton.....	1,567	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Downeyville and vic., Dr. Alembry Jump.....	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3			
Downey and vicinity, Dr. Q. J. Rowley.....	2,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
Etna Mills and vic., Dr. E. W. Bathurst.....	1,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
El Monte and vicinity, Dr. R. D. Adams.....	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2			
Elk Grove, Dr. J. A. McKee.....	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Eureka and vicinity, Dr. S. B. Foster.....	10,000	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9			
Elsinore, Dr. Thos. E. Ellis.....	800	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
Forest Hill and vicinity, Dr. Paul Reudy.....	3,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
Ft. Bidwell and vic., Dr. W. J. Wakeman.....	1,500	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Fresno, Dr. W. F. Maupin.....	10,796	16	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3			
Galt, Dr. Alex. Montague.....	700	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4			
Grass Valley and vic., Dr. W. R. Thomas.....	7,000	14	3	2	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3			
Gonzales, Dr. C. A. E. Hertel.....	450	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
Gridley, Dr. J. T. Harris.....	700	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Haywards, Dr. G. E. Alexander.....	1,625	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
Healdsburg, Dr. W. B. Coffman.....	4,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2			
Ione and vicinity, Dr. A. L. Adams.....	1,800	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2			

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*Including towns reporting no deaths, of an aggregate population of 4,650.

JANUARY, 1892.

Mortality reports from 118 cities, towns, villages, and localities, having an aggregate population of 819,913, show the number of deaths from all causes, in January, to have been 1,622, making a death rate of 1.97 per 1,000 for the month, or 23.64 per 1,000 per annum.

There were 223 deaths due to consumption, 285 to acute pneumonia, 75 to acute bronchitis, 12 to congestion of the lungs, 4 to diarrhoea and dysentery, 6 to cholera infantum, 43 to other diseases of the stomach and bowels, 42 to diphtheria, 16 to croup, 14 to scarlatina, 5 to measles, 7 to whooping-cough, 27 to typhoid fever, 2 to malarial fevers, 10 to cerebro-spinal fever, 44 to cancer, 4 to erysipelas, 110 to diseases of the heart, 12 to alcoholism, 96 to la grippe, and to all other causes 585.

There were 595 deaths from diseases of the lungs in January, as against 706 in December, and 42 from diphtheria, as against 58 in December, and 27 of typhoid fever, as against 36 in December. There was, however, an increase in mortality from la grippe, from 49 in December, to 96 in January. The death rate is, nevertheless, lowered from 2.19, in December, to 1.97 in January.

PREVAILING DISEASES.

Reports from 107 towns, villages, and localities, outside of the larger cities, give 7 of inflammation of the bowels, 5 of cholera morbus, 5 of cholera infantum, 81 of diarrhoea, 19 of dysentery, 102 of measles, 129 of scarlatina, 39 of diphtheria, 20 of croup, 1,798 of influenza, 191 of whooping-cough, 40 of erysipelas, 58 of typhoid fever, 118 of malarial fevers, 9 of cerebro-spinal fever, 174 of tonsilitis, 26 of inflammation of the kidneys, 89 of neuralgia, 35 of pleurisy, 154 of pneumonia, 80 of rheumatism, 381 of bronchitis, 27 of congestion of the lungs, 5 of chickenpox, 16 of pharyngitis, and 3 of inflammation of the brain.

There seems to have been no diminution in the prevalence of influenza, as it is reported from all quarters, and the mortality from that cause has nearly doubled in January.

The smallpox patient admitted to the Sacramento Pesthouse in December has been discharged as cured, and no new cases have appeared. The Chinese at the San Francisco quarantine station have also been discharged. The State is, at this time, free from smallpox.

Other Causes	1	2	5	9	0	3	8	1	2	1	1	4	3	3	42	1	2	0	6	2	1	2	6	2	3	0	0	30	1	14	6	
Alcoholism.....	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Heart Diseases	0	0	0	0	0	0	1	0	0	0	0	0	0	0	6	1	0	0	1	0	0	0	0	0	1	0	0	9	0	0	0	
Erysipelas.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Cancer.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	
Cerebro - Spinal Fevers.....	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	3	0	0	
Remittent and Intermittent Fevers.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Typhoid Fever....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Typho - Malarial Fever.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Whooping-Cough..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
Smallpox.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Measles.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Scarlet Fever.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	
Croup.....	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Diphtheria.....	0	0	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Other Diseases of St'mach & Bow'ls.....	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	0	0	
Cholera Infantum.....	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Diarrhoea and Dysentery.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Congestion of the Lungs.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Acute Bronchitis..	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Acute Pneumonia.	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	6	0	2	
Consumption.....	1	0	1	1	2	0	0	0	0	0	0	1	2	30	24	2	1	0	0	0	0	0	1	0	1	0	0	0	1	6	1	0
Total Deaths	2	3	8	10	0	5	11	2	4	2	6	116	6	2	6	2	2	0	4	2	0	7	3	10	7	1	0	78	1	21	10	
Estimated Popula- tion	450	700	3,800	4,000	1,771	200	1,800	2,000	400	1,500	1,000	600	1,645	1,500	50,394	4,000	2,009	300	4,000	2,000	800	1,200	2,000	1,200	3,000	400	100	750	50,000	1,000	2,000	
Locations and Authorities.	Longales, Dr. C. A. E. Hiertel Grudley, Dr. J. T. Harris Haywards and vic, Dr. G. E. Alexander. Healdsburg, Dr. W. B. Coffman Hollister, Dr. J. H. Tebbets Igo, Dr. Herman Schafer Jone and vicinity, Dr. A. L. Adams Jackson and vic, Dr. E. R. Robertson Lockeford, Dr. E. N. Foote Livermore, Dr. E. M. Keys Lincoln and vicinity, Dr. T. E. Hunt Laporte and vic, Dr. Orlando Pearson Los Gatos and vic, Dr. F. W. Knowles Lodi and vicinity, Dr. E. A. Burchard Los Angeles, Dr. G. MacGowan Marysville, Dr. D. Powell Merced, Dr. E. S. O'Brien Millville, Dr. J. N. Crabb Modesto and vicinity, Dr. W. J. Willhite Mariposa and vic, Dr. W. J. Kearney Middletown and vic, Dr. R. E. Hartley Monterey, Dr. S. H. Smith Martinez and vic, Dr. J. B. Tennant National City, Dr. J. W. Keene Nevada City and vic, Dr. C. L. Muller Newcastle, Dr. M. Schnabel Nicolaus, Dr. V. B. Watson Needles and vic, Dr. James P. Booth Oakland, Dr. J. P. Dunn, H. O. Oakdale, Dr. R. H. Endicott Oroville, Dr. J. H. M. Karsner Pasadena and vic, Dr. Henry H. Sherk Petatuma and vicinity, Dr. L. H. Fatty																															

REPORT OF THE STATE BOARD OF HEALTH.

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ABSTRACT FOR JANUARY, 1892.—Continued.

LOCATIONS AND AUTHORITIES.										
	Other Causes	Alcoholism	Heart Diseases	Erysipelas	Cancer	Cerebro - Spinal Fevers	Remittent and Intermittent Fevers	Typhoid Fever	Typho - Malarial Fever	Whooping-Cough
Washington and vic., Dr. B. Woodbridge	1	0	0	0	0	0	0	0	0	0
Wheatland, Dr. Lewis Melton	0	0	0	0	0	0	0	0	0	0
Winters and vicinity, Dr. Z. T. Magill	0	0	0	0	0	0	0	0	0	0
Willows and vicinity, Dr. L. P. Tooley	1	0	0	0	0	0	0	0	0	0
Williams, Dr. A. W. Kimball	1	0	0	0	0	0	0	0	0	0
Woodbridge, Dr. S. E. Latta	0	0	0	0	0	0	0	0	0	0
Yuba City and vicinity, Dr. T. P. Perry	2	0	0	0	0	0	0	0	0	0
Totals	681	12	110	4	44	10	2	27	0	7
Smallpox	0	0	0	0	0	0	0	0	0	0
Measles	5	0	0	0	0	0	0	0	0	0
Scarlet Fever	14	0	0	0	0	0	0	0	0	0
Croup	16	0	0	0	0	0	0	0	0	0
Diphtheria	42	0	0	0	0	0	0	0	0	0
Other Diseases of St'mach & Bow'ls	43	0	0	0	0	0	0	0	0	0
Cholera Infantum	6	0	0	0	0	0	0	0	0	0
Diarrhœa and Dysentery	4	0	0	0	0	0	0	0	0	0
Congestion of the Lungs	12	0	0	0	0	0	0	0	0	0
Acute Bronchitis	75	0	0	0	0	0	0	0	0	0
Acute Pneumonia	285	0	0	0	0	0	0	0	0	0
Consumption	223	0	0	0	0	0	0	0	0	0
Total Deaths	1,622	1	0	0	0	0	0	0	0	0
Estimated Population	819,913	600	700	1,000	3,000	500	300	5,469		

FEBRUARY, 1892.

Mortality reports from 118 cities, towns, villages, and localities, having an aggregate population of 813,877, show the number of deaths from all causes in February to have been 1,208, making a death rate of 1.48 per 1,000 for the month, or 17.76 per 1,000 per annum.

There were 129 deaths due to consumption, 122 to acute pneumonia, 57 to acute bronchitis, 12 to congestion of the lungs, 2 to diarrhœa and dysentery, 3 to cholera infantum, 43 to other diseases of the stomach and bowels, 42 to diphtheria, 9 to croup, 14 to scarlatina, 14 to measles, 6 to whooping-cough, 17 to typhoid fever, 10 to cerebro-spinal fever, 27 to cancer, 3 to erysipelas, 65 to diseases of the heart, 9 to alcoholism, 29 to la grippe, and to all other causes 535.

The death rate per 1,000 has decreased from 1.97 in January to 1.48 in February.

The most marked reduction in the death rate appears to be in diseases of the respiratory organs. In January there were 595 deaths from diseases of the lungs, while in February there were 380, being a reduction of 215.

The fatalities from la grippe fell from 96 in January to 29 in February, and deaths from diseases of the heart dropped from 110 in January to 65 in February.

PREVAILING DISEASES.

Reports from 109 towns, villages, and localities outside of the larger cities, give 8 cases of inflammation of the bowels, 13 of cholera morbus, 5 of cholera infantum, 84 of diarrhœa, 29 of dysentery, 173 of measles, 37 of scarlatina, 18 of diphtheria, 5 of croup, 553 of influenza, 125 of whooping-cough, 30 of erysipelas, 22 of typhoid fever, 176 of malarial fevers, 118 of tonsilitis, 5 of inflammation of the kidneys, 69 of neuralgia, 34 of pleurisy, 96 of pneumonia, 79 of rheumatism, 224 of bronchitis, 2 of congestion of the lungs, 4 of chickenpox, 20 of pharyngitis, and 6 of inflammation of the brain.

There is a great reduction in the prevalence of la grippe. One thousand seven hundred and ninety-eight cases were reported from the smaller towns in January, and but 553 in February. It is abating everywhere, except in a few localities where the cold weather prevails. Measles and whooping-cough are epidemic in several places. Fresno has an advanced case of leprosy in a Chinese.

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ABSTRACT FOR FEBRUARY, 1892—Continued.

Other Causes	4	7	0	0	0	9	3	0	1	1	1	5	0	0	3	1	1	1	0	2		564
Alcoholism.....	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	9	
Heart Diseases	0	1	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	65	
Erysipelas.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
Cancer	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	27	
Cerebro - Spinal Fevers.....	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	
Remittent and Intermittent Fevers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Typhoid Fever	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	17	
Typho - Malarial Fever.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Whooping-Cough.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	
Smallpox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Measles.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	
Scarlet Fever	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	
Croup.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
Diphtheria	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	42	
Other Diseases of St'mach & Bow'ls	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	
Cholera Infantum.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
Diarrhoea and Dysentery.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Congestion of the Lungs.....	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	
Acute Bronchitis.....	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	57	
Acute Pneumonia.....	1	2	0	0	1	2	0	0	0	0	0	0	0	2	1	2	0	1	0	0	122	
Consumption.....	5	1	0	0	2	4	0	2	1	0	0	0	0	0	0	0	0	0	0	0	189	
Total Deaths	11	11	6	1	3	22	3	2	1	1	5	2	2	8	1	4	3	1	1	2	1,208	
Estimated Population	5,864	10,000	5,216	2,000	3,000	14,376	2,800	4,000	800	400	1,300	2,000	300	6,000	9,000	2,500	1,000	3,000	500	700	813,877	
LOCATIONS AND AUTHORITIES.	Santa Barbara, Dr. R. F. Winchester.....	Santa Cruz and vic., Dr. B. A. Plant, H. O.	Santa Rosa, Dr. R. P. Smith.....	Sausalito and vic., Dr. G. C. Macdonald	Selma and vicinity.....	Stockton, Dr. C. A. Ruggles.....	St. Helena and vic., Dr. W. J. G. Dawson.	Suisun and vic., Dr. J. W. B. Reynolds	Susanville and vic., Dr. A. Milliken.....	Soquel and vicinity, Dr. H. O. Brink.....	Truckee and vicinity, Dr. W. Curless.....	Tulare City, Dr. C. F. Taggart.....	Upper Lake, Dr. R. G. Reynolds.....	Vallejo and vic., Dr. W. D. Anderson.....	Ventura and vic., Dr. A. J. Comstock.....	Watsonville and vic., Dr. W. D. Rodgers.....	Winters and vicinity, Dr. Z. T. Magill.....	Willows and vicinity, Dr. L. P. Tooley.....	Williams, Dr. A. W. Kimball.....	Yuba City, Dr. T. P. Perry.....	Totals	

Including the following towns, reporting no deaths: Auburn (pop., 1,931), Biggs (pop., 750), Calico and vicinity (pop., 1,500), Davisville and vicinity (pop., 1,500), Dixon and vicinity (pop., 2,500), Galt (pop., 700), Igo (pop., 200), Knights Ferry (pop., 250), Lincoln and vicinity (pop., 1,000), Millville (pop., 300), Nicolaus (pop., 100), Okdale (pop., 1,000), Placerville (pop., 1,684), San Mateo and vicinity (pop., 2,000), Santa Paula and vicinity (pop., 2,000), Sebastopol (pop., 500), Sierra Valley and vicinity (pop., 1,000), Vacaville and vicinity (pop., 4,500), Wheatland (pop., 700), Woodbridge (pop., 300).

MARCH, 1892.

Mortality reports from 116 cities, towns, villages, and localities, having an aggregate population of 813,821, show 1,176 deaths from all causes during the month of March. This corresponds to a death rate of 1.44 per 1,000 for March, or 17.28 per 1,000 per annum.

There were 191 deaths due to consumption, 89 to pneumonia, 39 to acute bronchitis, 11 to congestion of the lungs, 1 to diarrhoea, 1 to cholera infantum, 55 to other diseases of the stomach and bowels, 32 to diphtheria, 10 to croup, 14 to scarlatina, 12 to measles, 8 to whooping-cough, 19 to typhoid fever, 3 to malarial fevers, 4 to cerebro-spinal fever, 34 to cancer, 2 to erysipelas, 109 to diseases of the heart, 9 to alcoholism, 9 to influenza, and 533 to all other causes.

This shows a continued reduction in fatalities from respiratory diseases. In January there were 595 deaths from diseases of the lungs, in February 380, and in March 330.

There were 96 deaths in January from la grippe, 29 in February, and 9 in March.

January showed 110 deaths from diseases of the heart, February 65, and March 109.

Any reasons that might be advanced for these sudden fluctuations must necessarily be conjectural.

PREVAILING DISEASES.

Reports of prevailing diseases from 105 towns, villages, and localities outside of the large cities, show 60 cases of acute pneumonia, 21 of pleuritis, 209 of acute bronchitis, 5 of congestion of the lungs, 72 of diarrhoea, 30 of dysentery, three of cholera infantum, 4 of cholera morbus, 13 of diphtheria, 8 of croup, 93 of scarlatina, 90 of measles, 141 of whooping-cough, 181 of malarial fevers, 56 of typhoid fever, 6 of cerebro-spinal fever, 23 of erysipelas, 2 of inflammation of the brain, 11 of inflammation of the bowels, 15 of inflammation of the kidneys, 272 of influenza, 73 of neuralgia, 2 of puerperal fever, 79 of rheumatism, 83 of tonsilitis, 30 of pharyngitis, and one of chickenpox.

Measles are reported prevalent at Elk Grove, Monrovia, Watsonville, Folsom, and San Diego.

Sierra Valley reported 25 cases of scarlatina, Wheatland 23, Needles 20, and Santa Rosa 12. Fatalities have been very light, as the fever has been of a mild type.

Whooping-cough has been epidemic at Azusa, and has prevailed to some extent at Monrovia, Martinez, Auburn, Watsonville, and Marysville. Mumps has been reported from many different points.

Abstract of the Reports of Deaths and their Causes in California during March, 1892.

LOCATIONS AND AUTHORITIES.	Estimated Popula- tion	Total Deaths																								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Alturas, Dr. John M. Forrest	550																									
Alameda, Dr. John T. McLean	11,900																									
Alvarado and vicinity, Dr. Albert Fouch	600																									
Anaheim and vicinity, Dr. J. H. Ballard	5,000																									
Anaheim and vicinity, Dr. J. H. Ballard	1,401																									
Auburn, Dr. A. S. Waldo	2,000																									
Azusa and vicinity, Dr. J. H. Miller	2,000																									
Bakersfield and vic., Dr. C. A. Rogers	3,500																									
Berkeley, Dr. F. H. Payne	5,500																									
Biggs and vicinity, Dr. O. C. Hawkins	750																									
Calistoga, Dr. F. W. Mitchell	2,000																									
Colton and vicinity, Dr. M. F. Price	2,000																									
Carpeniteria and vicinity, Dr. R. Cauch	800																									
Cottonwood and vic., Dr. J. O. Smith	1,200																									
Cloverdale, Dr. R. S. Markell	1,500																									
Chico and vicinity, Dr. William King	8,800																									
Davisville, Dr. W. E. Bates	1,500																									
Dixon and vicinity	2,500																									
Downey and vicinity, Dr. Q. J. Rowley	2,500																									
Etna Mills and vic., Dr. E. W. Bathurst	1,000																									
El Monte and vicinity, Dr. R. D. Adams	1,650																									
Elk Grove, Dr. J. H. McKee	200																									
Eureka and vicinity, Dr. S. E. Foster	10,000																									
Forest Hill and vic., Dr. Paul Remy	3,000																									
Folsom, John Harris, H. O.	1,900																									
Galt, Dr. Alex. Montague	700																									
Grass Valley and vic., Dr. W. R. Thomas	7,000																									
Gridley, Dr. J. T. Harris	700																									
Haywards and vic., Dr. E. Alexander	3,800																									
Heldsburg, Dr. W. B. Coffman	4,000																									
Lockeford, Dr. E. N. Foote	400																									
Long Beach and vicinity, Dr. J. W. Wood	2,600																									
Laporte and vic., Dr. Orlando Pearson	600																									
Los Gatos, Dr. F. W. Knowles	1,645																									

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ABSTRACT FOR MARCH, 1892—Continued.

LOCATIONS AND AUTHORITIES.	Estimated Popula- tion	Total Deaths																							
		2	1	Consumption.....	Acute Pneumonia..	Acute Bronchitis..	Congestion of the Lungs	Diarrhoea and Dys- entery.....	Cholera Infantum..	Other Diseases of St'mach & Bow'ls	Diphtheria	Croup.....	Scarlet Fever	Measles.....	Smallpox	Whooping-Cough..	Typho - Malarial Fever.....	Typhoid Fever....	Remittent and In- termittent Fevers	Cerebro - Spinal Fever.....	Cancer	Erysipelas.....	Heart Diseases	Alcoholism.....	Other Causes
Suisun and vic., Dr. J. W. B. Reynolds..	4,000	2	1		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Sutter County, Dr. T. T. Perry.....	5,463	6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5
Sequel and vicinity, Dr. H. O. Brink.....	400	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Templeton and vic., Dr. O. P. Paulding.....	400	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Truckee and vicinity, Dr. W. Curless	1,300	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Tulare City, Dr. C. F. Taggart	2,000	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vallejo and vic., Dr. W. D. Anderson	6,000	13	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Ventura and vic., Dr. A. J. Comstock.....	9,000	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Vacaville and vicinity, Dr. J. W. Stitt	4,500	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Watsonville and vic., Dr. W. D. Rodgers	2,500	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Wheatland and vic., Dr. Lewis Melton.....	700	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Willows and vicinity, Dr. Rooney	3,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Woodbridge, Dr. S. E. Latta	300	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Woodland, R. B. Mosby, H. O.	3,069	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Totals	783,684	1,176	191	89	39	11	1	1	1	55	32	10	14	12	0	8	0	19	3	4	34	2	169	9	533

Including the following towns reporting no deaths: Anderson (pop., 1,000), Calico (pop., 500), College City (pop., 1,000), Downieville and vicinity (pop., 1,000), Fort Bidwell and vicinity (pop., 1,500), Fresno (pop., 10,796), Fresno Flats (pop., 600), Gonzales (pop., 350), Halfmoon Bay (pop., 450), Igo (pop., 200), Knights Ferry (pop., 250), Livermore (pop., 1,500), Lincoln (pop., 1,000), Lakeport (pop., 1,100), National City (pop., 1,200), Nicolaus (pop., 400), Needles and vicinity (pop., 750), San Rafael (pop., 3,891), Santa Maria (pop., 1,000), Sebastopol (pop., 500), Tehama (pop., 350), Upper Lake (pop., 300), Winters and vicinity (pop., 1,000), and Williams (pop., 500).

APRIL, 1892.

Mortality reports from 117 cities, towns, villages, and localities, having an aggregate population of 789,931, show 1,027 deaths from all causes during the month of April. This corresponds to a death rate of 1.030 per 1,000 for April, or 15.60 per 1,000 per annum.

There were 195 deaths due to consumption, 76 to pneumonia, 35 to acute bronchitis, 10 to congestion of the lungs, 9 to diarrhoea and dysentery, 5 to cholera infantum, 41 to other diseases of stomach and bowels, 26 to diphtheria, 11 to croup, 6 to scarlatina, 9 to measles, 11 to whooping-cough, 15 to typhoid fever, 4 to malarial fevers, 8 to cerebro-spinal fever, 39 to cancer, 2 to erysipelas, 84 to diseases of the heart, 9 to alcoholism, 2 to influenza, and 430 to all other causes.

This shows a continued though small reduction in fatalities from respiratory diseases.

In January there were 595 deaths from diseases of the lungs, in February 380, in March 330, and in April 306.

There were 96 deaths in January from la grippe, 29 in February, 9 in March, and 2 in April.

There were 6 deaths from scarlatina in April as against 14 in March.

PREVAILING DISEASES.

Reports of prevailing diseases from 85 towns, villages, and localities outside of the large cities, show 54 cases of acute pneumonia, 21 of pleurisy, 222 of acute bronchitis, 5 of congestion of the lungs, 180 of diarrhoea, 55 of dysentery, 10 of cholera infantum, 19 of cholera morbus, 13 of diphtheria, 20 of croup, 36 of scarlatina, 72 of measles, 87 of whooping-cough, 191 of malarial fevers, 17 of typhoid fever, 1 of cerebro-spinal fever, 49 of erysipelas, 4 of inflammation of the brain, 15 of inflammation of the bowels, 15 of inflammation of the kidneys, 174 of influenza, 76 of neuralgia, 104 of rheumatism, 89 of tonsillitis, and 27 of pharyngitis.

Measles is reported prevalent at Merced and Azusa.

There does not appear to have been any prevailing disease in April, but the temperature was below normal during the entire month, with unusually cloudy weather and damp atmosphere. There have been in consequence considerable rheumatism, neuralgia, and many sore throats.

On April 21st, a case of varioloid was discovered in Berkeley, Alameda County, in a married man, 25 years of age, by occupation a handler of foreign goods. The origin is unknown, but the patient stated to the local Health Officer, Dr. F. H. Payne, that about 10 days before he was attacked, a muffled Chinaman, having sores on his face, took a seat in a car next to him on the local train from San Francisco. No such Chinaman has yet been found. Strict quarantine, isolation, and vaccination were the restrictive and preventive measures adopted, and no new cases have developed yet.

On May 3d a case of varioloid was discovered on a fishing boat, on the Sacramento River, 4 miles above Sacramento City. The afflicted person is a native of the Sandwich Islands, aged 37 years, and came directly from San Francisco. Before being sent to the pesthouse, he walked with a companion from the wharf through 7 blocks of the business portion of the city, and voluntarily presented himself to the local authorities. The isolation of pesthouse regulations has been applied to the patient and his companion.

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ABSTRACT FOR APRIL, 1892—Continued.

LOCATIONS AND AUTHORITIES.	Estimated Popula- tion	Total Deaths														Other Causes
		3	14	4	1	0	0	0	0	0	0	0	0	0	0	
Sausalito and vic., Dr. G. C. Macdonald.	2,000	3	14	4	1	0	0	0	0	0	0	0	0	0	0	21
Stockton, Dr. C. A. Ruggles.	14,376	14	4	1	0	0	0	0	0	0	0	0	0	0	0	21
St. Helena and vic., Dr. W. J. G. Dawson.	2,800	4	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Suisun and vic., Dr. J. W. B. Reynolds.	4,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Sutter County, Dr. T. P. Perry.	5,469	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1
North Temescal, Dr. B. T. Mouser.	3,000	3	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Truckee and vicinity, Dr. W. Curless.	1,300	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Tulare City, Dr. C. P. Taggart.	2,000	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Ventura and vic., Dr. A. J. Comstock.	9,000	3	2	0	0	0	0	0	0	0	0	0	0	0	0	1
Vacaville and vicinity, Dr. J. W. Stitt.	4,500	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Watsonville and vic., Dr. W. D. Rodgers.	2,500	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Winters and vicinity, Dr. Z. T. Magill.	1,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Williams, Dr. A. W. Kimball.	500	3	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Woodland, R. B. Mosby, H. O.	3,069	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Totals.	789,931	1,027	135	76	35	10	9	5	41	26	11	6	9	0	11	432

Included in the above are the following places reporting no deaths: Calico (pop., 500), Calistoga and vicinity (pop., 2,000), Cedarville (pop., 200), Downieville and vicinity (pop., 1,000), Elsinore (pop., 800), Fort Bidwell and vicinity (pop., 1,500), Igo (pop., 200), Jackson and vicinity (pop., 2,000), Knights Ferry (pop., 250), Lockeford (pop., 400), Lincoln (pop., 1,000), Merced (pop., 2,000), Nicolaus (pop., 100), Oakdale (pop., 1,000), Pacific Grove (pop., —), Placerville and vicinity (pop., 1,084), Roseville (pop., 450), Sebastopol (pop., 500), Sierra Valley and vicinity (pop., 1,000), Soquel and vicinity (pop., 400), Templeton and vicinity (pop., 350), Tehama (pop., 300), Upper Lake (pop., 300), Wheatland (pop., 700), and Woodbridge (pop., 300).

MAY, 1892.

Mortality reports from 110 cities, towns, villages, and sanitary districts, having an aggregate population of 804,553, show 1,056 deaths from all causes during the month of May. This corresponds to a death rate of 1.31 per 1,000 for May, or 15.72 per annum.

There were 162 deaths due to consumption, 66 to pneumonia, 41 to bronchitis, 8 to congestion of the lungs, 10 to diarrhoea and dysentery, 17 to cholera infantum, 44 to other diseases of the stomach and bowels, 29 to diphtheria, 11 to croup, 15 to scarlatina, 6 to measles, 11 to whooping-cough, 14 to typhoid fever, 5 to malarial fevers, 1 to cerebrospinal fever, 31 to cancer, 4 to erysipelas, 95 to diseases of the heart, 6 to alcoholism, 2 to influenza, and 478 to all other causes.

This shows a continued though small reduction in fatalities from respiratory diseases. In January there were 595 deaths from diseases of the lungs, in February 390, in March 330, in April 306, and in May 277.

There were 96 deaths in January from la grippe, 29 in February, 9 in March, 2 in April, and 2 in May.

PREVAILING DISEASES.

Reports of prevailing diseases from 70 towns and sanitary districts outside of the large cities, show 18 cases of acute pneumonia, 17 of pleurisy, 135 of acute bronchitis, 5 of congestion of the lungs, 154 of diarrhoea, 65 of dysentery, 25 of cholera infantum, 42 of cholera morbus, 31 of diphtheria, 6 of croup, 23 of scarlatina, 57 of measles, 83 of whooping-cough, 150 of malarial fevers, 18 of typhoid fever, 30 of erysipelas, 17 of inflammation of the brain, 17 of inflammation of the bowels, 10 of inflammation of the kidneys, 63 of influenza, 77 of neuralgia, 70 of rheumatism, and 89 of tonsillitis.

Measles is reported at Merced and Santa Clara, but is also prevalent in other places. Whooping-cough prevailed in a number of localities. Diphtheria was reported epidemic at Riverside and College City, and scarlatina at Merced.

The case of varioloid at Berkeley and the one at Sacramento have both been discharged, and although sufficient time has elapsed, no new cases have developed.

Another case was reported from San Pablo, Contra Costa County, but it has been impossible to obtain reliable data concerning the previous history of the man afflicted. The usual precautions were adopted, and the patient will soon be, if he is not already, discharged.

A case of leprosy was recently discovered in Oakland, which came not long ago from the Hawaiian Islands. The local Board of Health was disturbed concerning the disposition which should be made of the case, inasmuch as there are no accommodations for lepers in California, outside of the county pesthouses. The leper (a woman) relieved the city of her unwelcome presence, and was next found in the City and County Hospital in San Francisco. The Health Department of Oakland is naturally solicitous concerning the large family of which the leprous woman was a member, all of whom are still domiciled there, including the woman's infant, only 2 months old.

The following resolution by the Oakland Board of Health will show the helpless condition in which any city or county may find itself placed, when brought to confront an unusual sanitary problem. There is appended, also, an extract from a letter by Dr. William M. Lawlor, Quarantine Officer and United States Quarantine Inspector at San Francisco:

"OAKLAND, CAL., June 4, 1892.

"*Resolved*, That the Secretary notify the State Board of Health of there being a large family in Oakland, one of the members of which, a woman with leprosy, was recently taken to the pesthouse in San Francisco;

"That her child, two months old, is still with the family in Oakland;

"That this family recently came from the Sandwich Islands;

"That the woman had leprosy before leaving the Sandwich Islands, but was permitted to land in San Francisco, from which place they came to Oakland;

"What measures should be taken, if any, in dealing with this family?

"Yours respectfully,

"PAUL J. SCHAFER,

"Secretary of the Board of Health of the City of Oakland."

The following is an explanatory extract from a letter by Dr. William M. Lawlor, Quarantine Officer at San Francisco:

"I have made inquiries as to the case of leprosy that was discovered in Oakland, and subsequently found in the City and County Hospital. From all that I can learn, the patient is afflicted with the disease in her hands and feet. I call attention to the fact that as leprosy is not a disease that comes under the head of strict quarantine regulations, such as smallpox or the other contagious diseases, that it would be an easy matter for a person afflicted, as the case under consideration, to pass my inspection without detection, and in this connection I wish to call attention to the fact that the case under discussion was in the hospital from Monday until the following Saturday without being discovered as a case of leprosy. It is the custom of this department to see and personally pass upon every soul aboard of all incoming vessels from foreign ports, and the strictest supervision is exercised to prevent the introduction of contagious diseases. We are of opinion that the above case comes strictly under the head of the United States Immigration Department, for upon the discovery of such a case the vessel would not be

detained, but the case of leprosy should be immediately returned to the port from which it came, and such action would have to be taken by the United States Immigration Inspector. Several cases have recently been discovered by this department, and reported to the Immigration Inspector, and have by him been returned. In this connection, I would respectfully suggest to the Governor the propriety of calling the attention of the authorities at Washington to the urgent necessity of having a competent medical officer connected with the United States Immigration Department, to make the examinations of all passengers coming under the Immigration Act, and by this means have a double check on all cases likely to be imported into the State. With leprosy, the most urgent and complete vigilance should be exercised to prevent its introduction, for we are menaced with this danger by the large and increasing immigration from the Hawaiian Islands of a class of immigrants in the extreme undesirable, consisting of the poorest class of Portuguese and Japanese, who have been working under contract. The resolutions passed by the Oakland Board of Health, with reference to the family, show the necessity of having a State lazaretto established, where such cases could be kept under observation. Leprosy cases are liable to be discovered and developed in any county of the State; they are liable to be introduced at any time by persons having the disease, and not having discovered it, or, having the germs in their system, it is developed at a later period. Such cases should not be thrown on San Francisco County simply because they were obliged to enter the State by the port of San Francisco."

It does not matter what legal points this case may involve. It serves merely to indicate that it must soon become the duty of the State to care for the unfortunates who may be found afflicted with this incurable and loathsome disease, within the borders of its territory, in a manner more appropriate and humane than in the county pesthouses.

Nearly every populous county in the State has more than once cared for lepers in pesthouses, but San Francisco has borne the greatest share of the burden. Those counties which have found it inconvenient to erect pesthouses, have kindly assisted the afflicted person to the metropolis, and in this way a considerable number have been cared for nearly all the time, which properly belonged in other counties. Sacramento has had a number of cases. Yolo had one or two in recent years. Fresno had one not long ago.

The State Board of Health has under consideration a bill, to be presented to the next Legislature, providing for a lazaretto in which to sequester this class of incurables, for all must agree that it is neither prudent nor proper to treat them as they are now being cared for.

Abstract of the Reports of Deaths and their Causes in California during May, 1892.

LOCATIONS AND AUTHORITIES.	Estimated Popula- tion	Total Deaths	Consumption.....	Acute Pneumonia.	Acute Bronchitis..	Congestion of the Lungs	Diarrhœa and Dys- entery.....	Cholera Infantum.	Other Diseases of St'mach & Bow'ls	Diphtheria	Croup	Scarlet Fever	Measles.....	Smallpox	Whooping-Cough..	Typho - Malarial Fever.....	Typhoid Fever	Remittent and In- termittent Fevers	Cerebro - Spinal Fevers.....	Cancer	Erysipelas.....	Heart Diseases	Alcoholism.....	Other Causes
Alturas, Dr. John M. Forrest	550	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
Alameda, Dr. John T. McLean	12,000	17	1	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	21
Anahiem and vicinity, Dr. J. H. Bullard	5,000	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Antioch and vicinity, Dr. W. S. George	1,000	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Anderson, Dr. L. J. Tabler	1,000	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Auburn, Dr. A. S. Waldo	1,601	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Azusa and vicinity, Dr. J. H. Miller	2,000	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Berkeley, Dr. F. H. Payne	5,500	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Biggs, Dr. O. C. Hawkins	750	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Calico, Dr. A. R. Rhea	500	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Calistoga, Dr. F. W. Mitchell	2,000	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Carpenteria and vicinity, Dr. R. Cauch	800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colton and vicinity, Dr. M. F. Price	2,000	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
College City, Dr. C. H. Gibbons	700	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cottonwood and vicinity, Dr. J. O. Smith	1,200	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cloverdale, Dr. R. S. Markell	1,500	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chico and vicinity, Dr. William King	8,800	11	3	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Davisville, Dr. W. E. Bates	1,500	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dixon, Dr. Aug. Traflet	1,567	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Downville and vic, Dr. Alembly Jump	1,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Downey and vicinity, Dr. Q. J. Rowley	2,500	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Etna Mills and vicinity, Dr. E. W. Badhurst	1,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
El Monte and vicinity, Dr. R. D. Adams	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elk Grove, Dr. J. H. McKee	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eureka and vicinity, Dr. S. B. Foster	10,000	13	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Ft. Bidwell and vic, Dr. W. J. Wakeman	1,500	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fresno Flats, Dr. J. N. McGowan	600	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Fresno, Dr. W. T. Maupin	10,736	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Folsom, John Harris, H. O.	1,930	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Galt, Dr. Alex. Montague	700	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grass Valley, Dr. W. R. Thomas	5,000	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gonzales and Soledad, Dr. C. A. E. Hertel	300	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gridley, Dr. J. T. Harris	700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LOCATIONS AND AUTHORITIES.	Estimated Popula- tion	Total Deaths	Consumption	Acute Pneumonia.	Acute Bronchitis..	Congestion of the Lungs	Diarrhœa and Dys- entery.....	Cholera Infantum..	Other Diseases of St'mach & Bow'ls	Diphtheria	Croup	Scarlet Fever	Measles.....	Smallpox	Whooping-Cough..	Typho - Malarial Fever.....	Typhoid Fever	Remittent and In- termittent Fevers	Cerebro - Spinal Fev'rs.....	Cancer	Erysipelas	Heart Diseases	Alcoholism	Other Causes	
Haywards and vic., Dr. G. E. Alexander.	3,800	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hollister, Dr. J. H. Tebbetts	2,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stone and vicinity, Dr. A. L. Adams	1,800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Jackson and vicinity, Dr. E. B. Robertson	2,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Knights Ferry, Dr. James H. Lowe	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lockeford, Dr. E. N. Foote	400	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Long Beach and vic., Dr. J. W. Wood	2,900	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Livermore, Dr. E. M. Keys	1,500	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lincoln, Dr. T. E. Hunt	1,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Laporte and vicinity, Dr. Orlando Pearson	800	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lakeport and vic., Dr. P. H. Thornton	1,500	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Los Gatos, Dr. F. W. Knowles	1,650	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Los Angeles, Dr. G. MacGowan	65,000	80	9	7	0	6	0	0	6	3	2	0	2	0	0	0	2	0	0	0	0	0	0	0	0
Marysville, Dr. D. Powell	6,000	3	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Merced, Dr. E. S. O'Brien	2,000	4	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
Modesto and vic., Dr. W. J. Wilhite	4,000	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
Middletown and vic., Dr. R. E. Hartley	800	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Madera, Dr. J. L. Burtin	400	6	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Monterey, David Roderick	1,200	5	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Napa, Dr. M. E. Pond	6,000	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
National City, Dr. J. W. Keene	1,200	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nevada City and vic., Dr. C. L. Muller	3,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Newcastle, Dr. M. Schnabel	175	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
Nicolaus, Dr. W. L. Short	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Needles and vic., Dr. James P. Booth	750	2	1	0	0	0	0	0	0	0	0	1	1	0	0	0	2	0	0	0	0	0	0	0	
Oakland, Dr. J. P. H. Dunn	50,000	69	8	9	1	1	0	0	5	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	
Oakdale, Dr. R. H. Endicott	1,000	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Oroville, Dr. J. H. M. Karsner	2,000	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ontario and vicinity, Dr. C. D. Watson	2,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pasadena and vic., Dr. Henry H. Sherk	10,000	15	7	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Placerville, S. D. No. 2, Dr. L. D. Marks	3,000	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
Pacific Grove, Dr. O. S. Trimmer	800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Plymouth and vic., Dr. W. A. Norman	1,200	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

JUNE, 1892.

Mortality reports from 109 cities, towns, villages, and sanitary districts, having an aggregate population of 788,073, show 121 deaths from all causes during June. This corresponds to a death rate of 1.29 per 1,000, or 15.48 per annum.

There were 136 deaths due to consumption, 58 to pneumonia, 24 to bronchitis, 5 to congestion of the lungs, 17 to diarrhoea and dysentery, 33 to cholera infantum, 63 to other diseases of the stomach and bowels, 22 to diphtheria, 7 to croup, 14 to scarlatina, 7 to measles, 5 to whooping-cough, 14 to typhoid fever, 3 to malarial fevers, 8 to cerebro-spinal fever, 1 to erysipelas, 34 to cancer, 89 to diseases of the heart, 6 to alcoholism, and 475 to other causes.

No deaths from la grippe were reported in June.

PREVAILING DISEASES.

Reports of prevailing diseases from 70 towns and sanitary districts outside of the large cities, show 23 cases of pneumonia, 77 of bronchitis, 6 of pleuritis, 6 of congestion of the lungs, 200 of diarrhoea, 57 of dysentery, 53 of cholera morbus, 32 of cholera infantum, 77 of inflammation of the bowels, 20 of diphtheria, 32 of scarlatina, 31 of measles, 15 of whooping-cough, 43 of la grippe, 24 of typhoid fever, 118 of malarial fevers, 6 of cerebro-spinal fever, 13 of erysipelas, 69 of rheumatism, 63 of neuralgia, and 72 of tonsillitis.

June was comparatively a healthy month. The death rate per 1,000 was 1.29, against 1.47 in 1891. There is shown an increase of diseases of the stomach and bowels, but that is expected in summer, when the fruit ripens. Cholera infantum is more frequently fatal during the warm weather.

Those diseases which increased the mortuary reports of the winter continue to abate. Smallpox is not reported at all. It is, however, reported epidemic at Victoria, B. C., and although Oregon and Washington lie between us and that point, it may very soon be necessary to place an Inspector at the northern boundary of the State to detain any persons showing symptoms of the disease.

Cholera, true to tradition, is following upon the heels of la grippe. It has leaped all boundaries between Asia and Europe, and is reported as devastating the famine-stricken districts of Russia. But with the rapid and easy methods of travel, cholera no longer moves at a man's pace. Like a winged messenger, it has arrived in the great capitals of Europe, and consultations are being held to decide what best may be done to stay its fatal spread. Common prudence would dictate that we look after our private and municipal sanitary affairs. It is just as well to expect no benefits from quarantine in cholera. It has never alone checked the progress of this disease. Cholera has always mocked at quarantine, but it has been repeatedly balked by want of filth and polluted soil to breed in and spread from. It is the duty of medical men to explain to the public that cholera is not contracted, like smallpox, measles, and scarlatina, but from swallowing the germs in water and food, or, after they have effected a lodgment in the throat, from a vitiated and poisoned atmosphere. We may not be visited at all, but the specter will be shorn of half its terrors when we have done all there is to be accomplished to hold it back.

Abstract of the Reports of Deaths and their Causes in California during June, 1892.

LOCATIONS AND AUTHORITIES.	Estimated Popula- tion	Total Deaths	Consumption.....	Acute Pneumonia.	Acute Bronchitis..	Congestion of the Lungs.....	Diarrhœa and Dys- entery.....	Cholera Infantum.	Other Diseases of St'mach & Bow'ls	Diphtheria	Croup	Scarlet Fever	Measles.....	Smallpox	Whooping-Cough..	Typho - Malarial Fever.....	Typhoid Fever	Remittent and In- termittent Fevers	Cerebro - Spinal Fevers.....	Cancer	Erysipelas.....	Heart Diseases	Alcoholism.....	Other Causes
Alvarado, Dr. Albert Fouch.....	600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alturas, Dr. John M. Forrest.....	550	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alturas, Dr. John T. McLean.....	12,300	18	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alameda, Dr. J. H. Bullard.....	5,000	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Anahiem, Dr. J. H. Bullard.....	3,000	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Antioch and vicinity, Dr. W. S. George.....	3,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Anderson, Dr. J. T. Harris.....	1,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Anderson, Dr. A. S. Waldo.....	1,601	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Auburn, Dr. A. S. Waldo.....	2,000	4	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Azusa and vicinity, Dr. J. H. Miller.....	5,500	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Berkeley, Dr. F. H. Payne.....	2,000	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Berkeley, Dr. F. H. Payne.....	500	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Berkeley, Dr. F. H. Payne.....	500	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Berkeley, Dr. F. H. Payne.....	800	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Berkeley, Dr. F. H. Payne.....	2,000	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Berkeley, Dr. F. H. Payne.....	700	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
College City, Dr. C. H. Gibbons.....	1,200	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cottonwood and vic., Dr. J. O. Smith.....	1,200	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cottonwood and vic., Dr. J. O. Smith.....	1,500	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cloverdale, Dr. R. S. Markell.....	1,500	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chico and vicinity, Dr. William King.....	8,800	9	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chico and vicinity, Dr. William King.....	1,500	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Davisville, Dr. W. E. Bates.....	2,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dixon, Dr. Aug. Traflet.....	2,000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Downville and vic., Dr. Alembly Jump.....	1,000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
El Monte and vicinity, Dr. R. D. Adams.....	1,650	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elk Grove, Dr. J. H. McKee.....	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Enreka and vicinity, Dr. S. B. Foster.....	10,000	9	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elsinore, Dr. Thomas B. Ellis.....	800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fort Bidwell and vic., Dr. Geo. Kober.....	1,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fresno Flats, Dr. J. N. McGowan.....	600	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Fresno, Dr. W. T. Mainin.....	12,000	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Folsom, John Harris, H. O.....	1,960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Galt, Dr. Alex. Montague.....	700	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gonzales, Dr. C. A. E. Hertel.....	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gridley, Dr. J. T. Harris.....	700	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Haywards, Dr. G. E. Alexander.....	3,800	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Headsburg and vic., Dr. N. B. Coffman.....	4,000	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[illegible]

*Sierra Valley and vicinity, population 1,000, no deaths.

FINANCIAL STATEMENT.

STATEMENT OF THE EXPENSES OF THE STATE BOARD OF HEALTH FOR THE FORTY-SECOND FISCAL YEAR, ENDING JUNE 30, 1891.

Appropriation March 21, 1889.....	\$1,500 00
Balance from forty-first fiscal year.....	303 14
1890.	
July.—Expressage.....	\$1 90
Traveling expenses.....	25 00
Traveling expenses, C. A. Ruggles.....	14 50
Traveling expenses, J. M. Briceland.....	29 40
Traveling expenses, H. S. Orme.....	50 00
Postage stamps.....	20 00
Telegrams.....	1 85
Typewriter.....	100 00
Office rent.....	25 00
Aug.—Expressage.....	55
Telegraphing.....	95
Traveling expenses.....	20 00
Postage stamps.....	15 00
Stationery.....	2 55
Wood engraving for report.....	20 00
Office rent.....	25 00
Sept.—Carpet sweeper for office.....	3 50
Duster.....	50
Postage stamps.....	15 50
Stationery.....	9 10
Telegraphing.....	2 10
Post Office box rent.....	2 00
Subscription "Annual of Hygiene".....	14 50
Office rent.....	25 00
Oct.—Typewriter cabinet.....	13 30
S. S. Herrick, compiling laws.....	75 00
Expressage.....	40
Traveling expenses, Secretary.....	32 50
Traveling expenses, J. M. Briceland.....	40 50
Traveling expenses, C. A. Ruggles.....	51 90
Traveling expenses, H. S. Orme.....	67 75
Office rent.....	25 00
Telegraphing.....	9 39
Nov.—Stamps.....	10 00
Hopkins.....	1 00
Stamps.....	22 00
Wrappers.....	5 00
Expressage on Biennial Report.....	40 95
Freight on Biennial Report.....	1 00
Expressage on Biennial Report.....	12 80
Stamps.....	47 00
Telegraphing.....	40
Stationery.....	2 95
Office rent.....	25 00
Crocker & Co.....	8 00
Stamps.....	23 00
Traveling expenses.....	15 00
Expressage.....	1 75
Stamps.....	12 00
Traveling expenses.....	15 00
H. S. Crocker & Co., envelopes.....	13 30
Traveling expenses.....	15 00
Traveling expenses, C. A. Ruggles.....	17 00
Telegraphing.....	2 15
Post Office box rent.....	2 00
Office rent.....	25 00

1891.

Jan.—	C. S. Houghton.....	40		
	H. S. Crocker, stationery.....	3 15		
	Stamps.....	4 00		
	"Sanitary News".....	2 00		
	Traveling expenses, C. A. Ruggles.....	12 90		
	Traveling expenses, J. M. Briceland.....	27 00		
	Traveling expenses, H. S. Orme.....	47 00		
	"Sanitary Record".....	3 02		
	"Sanitarian".....	4 00		
	Stamps.....	15 00		
	Expressage.....	1 15		
	Telegraphing.....	75		
	Office rent.....	25 00		
Feb.—	Telegraphing.....	54		
	Office rent.....	25 00		
March—	A. P. H. Association, subscription.....	5 00		
	Postage.....	10 00		
	Expressage.....	3 80		
	Engraving stamps.....	2 50		
	Traveling expenses, C. A. Ruggles.....	9 15		
	Post Office box rent.....	2 00		
	Telegrams.....	3 00		
	Postal cards.....	10 00		
	Office rent.....	25 00		
April—	Postal cards.....	5 00		
	Stationery.....	3 55		
	Traveling expenses, J. M. Briceland.....	27 50		
	Traveling expenses, C. A. Ruggles.....	12 40		
	Traveling expenses, R. B. Cole.....	15 00		
	Traveling expenses, H. S. Orme.....	51 75		
	Office rent.....	25 00		
	Traveling expenses, C. A. Ruggles.....	3 50		
	Traveling expenses, C. W. Nutting.....	48 10		
	Traveling expenses, W. G. Cochran.....	54 00		
	Traveling expenses, P. C. Remondino.....	65 00		
May—	N. Eldred, hauling furniture, etc.....	5 00		
	H. Williams, packing books.....	2 50		
	Postage stamps.....	14 00		
	Official census.....	2 50		
	Expressage.....	85		
	Office rent.....	25 00		
June—	Postage stamps.....	5 00		
	Postage stamps.....	15 00		
	Expressage.....	3 70		
	Office rent.....	25 00		
	Three book cases.....	26 00		
	Total.....	\$1,733 65		
	Balance.....	69 49		
	Total.....	\$1,803 14	\$1,803 14	

STATEMENT OF THE EXPENSES OF THE STATE BOARD OF HEALTH FOR THE FORTY-THIRD
FISCAL YEAR, ENDING JUNE 30, 1892.

Appropriation April 6, 1891.....		\$1,500 00
July—	Traveling expenses of C. A. Ruggles.....	\$14 40
	Traveling expenses of W. G. Cochran.....	50 50
	Office rent.....	25 00
	Overhauling books.....	2 50
	Stationery, etc.....	3 25
	Postage stamps.....	15 00
	Expressage.....	2 85
August—	Office rent.....	25 00
	Postage stamps.....	10 00
	Expressage.....	2 25
	Telegraphing.....	1 65
	Western Union Telegraph Co.....	5 43
Sept.—	Office rent.....	25 00
	Stamps.....	10 00
	Expressage.....	50
	Traveling expenses, J. R. Laine.....	10 60

October—	Traveling expenses, W. G. Cochran.....	91 60		
	Traveling expenses, C. W. Nutting.....	88 45		
	Traveling expenses, C. A. Ruggles.....	55 05		
	Traveling expenses, J. R. Laine.....	46 85		
	Office rent.....	25 00		
	Postage stamps.....	10 00		
	Postal cards.....	10 00		
	Expressage.....	1 20		
	For typewriting.....	5 00		
Nov.—	Office rent.....	25 00		
	Postage.....	40 00		
	Expressage.....	40		
	Telegrams.....	1 64		
	Glazing.....	75		
	Stationery.....	3 50		
Dec.—	Office rent.....	25 00		
	Postage.....	20 00		
	Expressage.....	50		
1892.				
Jan.—	Expressage.....	1 05		
	Traveling expenses, W. G. Cochran.....	50 50		
	Traveling expenses, C. A. Ruggles.....	14 40		
	Stamps.....	20 00		
	Office rent.....	25 00		
Feb.—	Office rent.....	25 00		
	Postage.....	25 00		
	Subscription "Sanitarian".....	4 05		
	Subscription "Sanitary Record".....	2 60		
	Telegrams.....	35		
	Expressage.....	1 75		
March—	Office rent.....	25 00		
	Postage.....	25 00		
	Expressage.....	50		
April—	Office rent.....	25 00		
	Postage.....	40 00		
	Expressage.....	30		
	Telegraphing.....	40		
	Traveling expenses, C. A. Ruggles.....	33 90		
	Traveling expenses, P. C. Remondino.....	70 00		
	Traveling expenses, W. G. Cochran.....	55 50		
	Traveling expenses, C. W. Nutting.....	53 40		
	Traveling expenses, J. R. Laine.....	24 00		
May—	Traveling expenses, J. R. Laine.....	44 45		
	Traveling expenses, W. G. Cochran.....	5 45		
	Traveling expenses, P. C. Remondino.....	28 00		
	Traveling expenses, C. A. Ruggles.....	70 20		
	Office rent for May.....	25 00		
	Postage.....	40 00		
	Postal cards.....	45 00		
June—	Office rent.....	25 00		
	Postage stamps.....	10 00		
	Statutes, 1891.....	2 50		
	H. S. Crocker, Codes and scales.....	19 00		
	Total.....	\$1,491 17		
	Balance.....	8 83		
	Total.....	\$1,500 00	\$1,500 00	

EXPENSES OF THE STATE BOARD OF HEALTH ON ACCOUNT OF CONTAGIOUS AND INFECTIOUS DISEASES FOR THE FORTY-SECOND AND FORTY-THIRD FISCAL YEARS.

1890.				
July 1—	Unexpended balance in appropriation.....		\$5,982 45	
1892.				
April 12—	Traveling expenses, P. C. Remondino.....	\$250 00		
	Balance.....	5,732 45		
	Total.....	\$5,982 45	\$5,982 45	

Cholera
 Cholera
 Diarrhoea
 Smallpox
 Measles
 Scarletina
 Diphtheria
 Croup
 Influenza
 Whooping
 Erysipelas
 Fevers--

Syphilis
 Alcohol
 Hydrocephalus
 Tuberculosis
 Phthisis
 Marasmus
 Scrofula
 Rheumatism
 Cancer
 Pneumonia
 Pleurisy
 Bronchitis
 Other diseases
 Enteritis
 Gastritis
 Gastroenteritis
 Peritonitis
 Disease
 Other diseases
 Bright's
 Aneurysm
 Heart disease
 Convulsions
 Other diseases
 Puerperal
 Old age
 Suicide
 Heat, diseases
 All other
 Stillbirths

Total

* M

who has died of diphtheria is extremely dangerous.

Cholera
 Cholera
 Diarrhea
 Smallpox
 Measles
 Scarlet
 Diphtheria
 Croup
 Influenza
 Whooping
 Erysipelas
 Fevers-

Syphilis
 Alcohol
 Hydrocephalus
 Tuberculosis
 Phthisis
 Marasmus
 Scrofula
 Rheumatism
 Cancer
 Pneumonia
 Pleurisy
 Bronchitis
 Lungs, &
 Other diseases
 Enteritis
 Gastritis
 Gastro-enteritis
 Peritonitis
 Diseases
 Other diseases
 Bright's
 Aneurysm
 Heart diseases
 Convulsions
 Other diseases
 Puerperal
 Old age
 Suicide
 Heat, &
 All other
 Stillbirths

Totals

who has died of diphtheria is extremely dangerous.

PREVENTIVE DISEASE CIRCULARS.

DIPHTHERIA; ITS RESTRICTION AND PREVENTION.

USEFUL INFORMATION PUBLISHED FOR GENERAL DISTRIBUTION.

[CIRCULAR No. 1.]

Diphtheria is so frequently malignant and fatal in its effects that the State Board of Health, in the exercise of its functions in the restriction and prevention of disease, deems it necessary to furnish the public with information with reference to the manner of its propagation, coupled with such suggestions concerning the best known methods of limiting its progress as any person of average intelligence may easily put to practical use.

It should be generally understood that diphtheria is a contagious and infectious disease, which attacks by preference the young, and especially those whose vital resistance has been reduced by exposure to filth, uncleanness, the emanations from sewers, drains, and all unsanitary influences.

HOW DIPHTHERIA IS CONTRACTED.

The infectious substance of diphtheria is conveyed from the mouth, nose, air passages, and discharges from the bowels of those who have the disease. It is believed, with some reason, that the perspiration and urine may contain it. Domestic animals, such as cats, dogs, chickens, and tame pigeons are credited with carrying the disease from one person to another, either by having the disease themselves, or because of having been handled by persons who were afflicted with it. It may be transmitted in water, milk, or other liquids, or in food or clothing, or by kissing a person who has a sore throat, without suspicion that it is diphtheria.

The secretions of the mouth and nose of a diphtheritic patient, mixed, as they must necessarily be, with the exudative deposit, are often allowed to fall upon the bedclothes and carpets, where they dry and remain for an indefinite length of time. These are liable to be detached by the friction of the fabric, or the shuffling of feet upon the floor, when the poison rises as dust in fine particles, and lodges in throat, nose, windpipe, or stomach of the person who may respire the air so contaminated.

Some persons have so much vital resistance to disease that it does not take root and develop. Others, however, have the susceptibility to its growth and fatal effects.

It should be remembered that a malignant form of the disease may be contracted from a person having it in a very mild form.

Exposure to an atmosphere contaminated by the body of a person who has died of diphtheria is extremely dangerous.

RULES AND PRECAUTIONS TO BE OBSERVED BY ALL WHO COME IN CONTACT WITH DIPHThERIA.

1. Whenever diphtheria is known to be in the neighborhood, all children with sore throats should be kept apart from other children until a competent physician has determined that the sore throat is not diphtheria.

2. A person with diphtheria should be placed in a room in the upper story of the house, if convenient, as remote as possible from direct communication with others, and access should be denied to all but the necessary attendants. All superfluous furniture, including carpets, curtains, clothing, and books, should be removed from the apartment. There should be free ventilation without drafts.

3. A card with DIPHThERIA printed in large type should be placed in a conspicuous position on the house, and no child should be allowed to enter.

4. No food or drink that has been exposed to the atmosphere of the sick-room should be used by well persons, and the dishes used in the sick-room should be washed separately.

5. Neither the bedclothes nor the patient's body linen should be mixed with other soiled clothes or admitted to the general wash until they are first disinfected.

6. No person recently recovered from diphtheria should attend school, church, or other public assemblies, until declared by a competent physician to be no longer capable of transmitting the contagion.

7. Under no circumstances should a public funeral be held of a person dead of diphtheria. Neither must children be permitted to attend. Upon this point health officials cannot be too firm and unyielding. All personal considerations and sentiment must be subordinated to considerations of public safety.

The importance of this course should be explained by the medical profession to clergymen of all denominations, and their influence and coöperation earnestly solicited, in order that the objections and prejudices of the careless and uninformed may be more easily overcome.

DISINFECTION.

As the discharges from the nose and throat are highly contagious, they should be received on cloths, which should be immediately burned. The urine, vomited matter, and discharges from the bowels should be received in a vessel containing a solution of chloride of lime in the proportion of six or eight or more tablespoonfuls in a gallon of soft water. They should be allowed to remain in this solution at least fifteen minutes before being deposited in a privy vault or water-closet.

DISINFECTION OF CLOTHING AND PREMISES.

The soiled linen, clothing, and towels should, if possible, be boiled in hot water for thirty minutes before leaving the room; but if this be inconvenient, a solution of sulphate of zinc (white vitriol) should be made by dissolving half a pound of the zinc with six tablespoonfuls of common table salt in a gallon of water, in which the clothes should be soaked two hours before being washed.

Some physicians may recommend solutions of sulphate of iron (green copperas) instead of a solution of chloride of lime, and a solution of corrosive sublimate or carbolic acid instead of sulphate of zinc.

It has been demonstrated, however, that copperas is not properly a *disinfectant*. It is an excellent antiseptic, arresting putrefactive decomposition, but it does not destroy the vitality of disease germs or the infecting power of materials containing them.

Corrosive sublimate solutions are poisonous, and when used should be kept in earthen, glass, or wooden vessels, and should invariably be labeled POISON.

Carbolic acid is also poisonous, and, like chloride of lime, is sometimes objectionable on account of its odor.

The chloride of lime solution for the secretions and dejections of the body, and the zinc solution for the clothes and linen, will, perhaps, be the most economical and easily obtained for general use, and will prove sufficient and satisfactory. The use of any of these agents must be determined by the attending physician.

The attendants should observe scrupulous cleanliness of hands and clothing. They should not appear in public until after having first changed their clothes and otherwise removed all possibility of carrying the contagion.

In case of death, let the body be wrapped in a sheet which has been soaked in the zinc solution, and incased in a tight coffin. The interment should be private, and in no case should the remains be exposed to view.

The room which has been occupied by the sick should, after death or recovery, be effectively disinfected.

Articles which cannot be washed or boiled should be exposed to dry heat at a temperature of 230° Fahrenheit for three or four hours, the articles being freely exposed and not folded or piled up. Otherwise, the room and its contents must be fumigated by the fumes of burning sulphur.

FUMIGATION WITH SULPHUR is performed by first closing doors and windows and all apertures through which the gas might escape. Then the floors, walls, and furniture must be thoroughly dampened. For a room ten feet square, three pounds of sulphur, in fragments, are placed in an iron pan supported by bricks placed in a tub containing a few inches of water. The sulphur is then moistened with alcohol and set on fire. When well ignited, shut the door and keep the room tightly closed several hours. When sufficiently fumigated, open the room freely to the air until thoroughly ventilated, when it will again be fit for occupancy.

In addition to these precautions the cellars, privies, water-closets, cess-pools, drains, sewers, and all other probable sources of filth, should be cleansed and treated to a solution of copperas. Stagnant water should be drained. Let the sunshine into the rooms of the houses, and remember that pure water, pure air, and sunshine are the greatest natural preventives of contagious diseases.

These, in short, are the rules most generally adopted in the restriction of this destroyer of the young. They are as briefly stated as may be consistent with clearness, for there must be a comprehension of their scope and purport in order to exercise that influence and good which is the object to be attained.

Much more might be added, but this would lead to the consideration of medical subjects not deemed essential in directions for the guidance of the general public.

For information concerning the treatment of diphtheria it is necessary to look to the attending physician. He should supply you with this or some other pamphlet containing like information, which few busy practitioners have the leisure to verbally explain, and which few persons would be likely to remember.

The foregoing methods, modified by the attending physician to meet the exigency of the case, may be employed in all contagious diseases.

In order to effect the good which it is intended this pamphlet should accomplish, it should be given a wide distribution. It should either be preserved for possible future use, or should be sent to friends and neighbors who have need of such information in their distress.

Copies may be procured for free distribution by applying to the Secretary of the State Board of Health, Sacramento.

By order of the State Board of Health.

THE DANGERS ARISING FROM PUBLIC FUNERALS OF THOSE WHO HAVE DIED FROM CONTAGIOUS AND INFECTIOUS DISEASES.

Addressed to the Clerical Profession.

[CIRCULAR No. 2.]

The State Board of Health of California, realizing fully the benign influence of the reverend clergy of the State, and having a high appreciation of their functions as leaders and teachers of the people, would especially invoke their influence and coöperation in the instruction of the public in the principles of health and its preservation. Because of their general intelligence and widespread professional influence, they can exert greater *personal* influence than any other class or profession. Their visits are always missions of consolation and mercy. Unlike other professions, these duties are performed without fee or reward. There is thus engendered a confidential reverence for those so forgetful of self as to be ready at any and all times to speak words of hope, courage, and trust, when light has departed from the household and despair sits perched upon the family altar.

It may be superfluous to call the attention of so intelligent a class of men to a subject on which nearly all may have formed well-defined opinions; but having in mind the closeness of the pastoral relation to human life, the social standing of families, and the reciprocal feeling among friends and neighbors, it is deemed necessary to reinforce their convictions of what it is proper to do, by the conversion of such convictions into custom and law.

The Board, therefore, respectfully asks the attention of ministers of all denominations and of every order to the practice of holding public funerals of persons who have died of contagious or infectious diseases. In many cities and towns there exists a municipal regulation or ordinance prohibiting a public or church funeral of any person who has died of Asiatic cholera, smallpox, typhus fever, diphtheria, yellow fever, scarlet fever, or measles, and directing the family of deceased to limit the attendance to as few as possible, and to take all precautions to pre-

vent the exposure of other persons to contagion or infection. The person authorizing the public notice of death is also required to publish the name of the disease which caused the death of the person whose funeral is to be held. Where such local regulations are in force the clergy are relieved from the painful duty of refusal to perform such services.

Many amiable and otherwise well-informed people will importune the minister to officiate at a public funeral of a precious child that has died of diphtheria or scarlet fever. They cannot or will not understand that a compliance with the request endangers not only the lives of those present, but the lives also of the children of the kind pastor, who would not inflict pain by refusing, and of the children of sorrowing friends who inspect the remains in the casket, and follow them to the grave. It is to prevent such consequences that the suggestion is made that those of the clergy who live in cities and towns should so use their influence with the municipal authorities as to induce them to adopt an ordinance restraining any one from officiating at a public funeral in case of death from contagious diseases.

It is believed that considerations of personal and public safety need not be urged in support of the vital necessity of such action when addressing the clerical profession. If it were necessary to cite authorities to convince them that contagious diseases may be communicated by exhalations from the bodies of the dead, as well as by contact with living persons afflicted with the disease, they could be furnished without number. This would be the universal testimony of medical men. But it is considered unnecessary to furnish and multiply instances of infection and fatal results arising from public funerals in the case of contagious diseases. The principal thing is to refuse to hold such public services, no matter what the social standing of the family of deceased may be. Objections may arise to what at first may appear to be an extreme course. There is planted deep in the human heart a desire to honor the dead, and there are unfortunately many who think this can best be shown by a public funeral. They believe that to neglect public funeral rites is to manifest a lack of proper regard for the memory of the dead.

At this moment, when an atmosphere of sorrow and gloom pervades the home, considerations of safety for the living are apt to be received with indifference and contempt. Whatever is said to the bereaved relatives at such a time, must be spoken with the utmost gentleness. But they must be instructed as to the duty of subordinating their wish to honor the dead, to the duty of preserving the health and lives of the living. It is believed that most persons will yield in this matter if properly advised. But if any are unreasonable, and insist upon public funeral rites with an apparent disregard for the safety of others, the police power of the municipality or the State should be invoked to teach such persons that it is a high moral duty to forego their preference, and to subordinate their individual desires that the welfare of the community may be conserved. Fortunately, in California, sanitary legislation has been such as to invest cities, towns, and sanitary districts with all the powers needed for the protection of their respective localities. But as all know, such laws depend in a great measure upon public opinion for their enforcement. The sentiment of the community must be taken into account, and as the affairs of funerals have been almost entirely delegated to the church, ministers of the gospel stand in a position to

explain to the people how it is possible to manifest proper and fitting respect for the dead without disregard for, and danger to, the living. Not only should it be explained that it may be contrary to law, but that it is also thoughtless and selfish for the members of one family to insist that persons from many other homes shall be subjected to the danger of infection, in order that a public funeral service may be held over the unconscious remains of one who can neither be benefited by it nor injured by its omission. The clerical and medical professions agree on all important questions relating to the preservation of human life and the betterment of humanity. It is certainly desirable that the two professions that have to deal with the hopes and fears, the joys and sorrows, the life and death of mankind, as an inseparable function of their office, should enjoy each other's confidence and earnest coöperation in any measure calculated to ameliorate the condition of the human race.

It is sincerely hoped that the sentiments herein contained will meet the approval of those to whom this is addressed.

By order of the State Board of Health.

THE DANGERS ARISING FROM TAKING OFF THE HAT OUT OF DOORS DURING FUNERAL SERVICES.

Addressed to the Clerical Profession and Officers of Secret, Fraternal, and Beneficiary
Societies of California.

[CIRCULAR No. 3.]

The frequency of reported cases of severe illness, and sometimes death, traceable to the removal of the hat at funerals, has determined the California State Board of Health to address the reverend clergy and the officers of secret, fraternal, and beneficiary societies throughout the State, respectfully directing their attention to the serious consequences which not infrequently follow the observance of the custom during the prevalence of inclement weather or under the rays of a hot summer sun.

The hat is used as a covering for the head. In an infinite variety of shapes and patterns the hat or cap has been worn from times of remote antiquity. In its various forms it has been known under different names, and adopted by some nations as a symbol. The most ancient form is the cap, such as is seen in figures representing the goddess of liberty. The Grecian *pileus* was a woolen cap sometimes worn as a lining to the helmet. The aged and infirm Romans wore caps of the same material for warmth. When conical, the cap was the *apex* of the Roman priests, worn probably from the time of Numa. With the elevated crest pointed forward, like the liberty cap, it was the Phrygian or Mysian bonnet. With a brim it became the *petasus*, a hat much like the round felt hats now worn. Among the Romans the cap was a symbol of liberty, and slaves were presented with one on receiving their freedom. In modern times it has been a conspicuous article of dress, and has been adorned with showy plumes, jewels, and rosettes. It has also been worn as a mark of authority, and its shape and ornamentation have frequently made it an insignia of rank and station. Its form, and sometimes its color, has been made to designate the rank and character of its wearer, as the monarch, by his crown; the cardinal, by his red hat, betokening his readiness to spill his blood for the sake of the

Savior; and the court fool, with his cap and a bell. In one form it serves to distinguish the military officer, and in another the peaceful Quaker. The wearing of a hat as an article of apparel is an almost universal custom. There must underlie the wearing of a covering for the head a deeper significance than a mere conformity with the prevailing fashion.

The spectacle of an adult person walking the streets or country roads, or laboring in the open air, without wearing a hat, would excite comment everywhere. Doubts of the mental soundness of the person would be freely expressed. The custom of hat wearing arose from necessity. Every one will acknowledge the warmth and comfort of a fur or woolen cap or hat in cold and stormy weather. The fashion of wearing the hair short increases the need of an artificial protection to the head, while to those who are bald it is indispensable to the preservation of good bodily health. Nurses often find it necessary to put a flannel bonnet on the heads of young infants before they can be cured of cold in the head and nostrils. A foundation for chronic nasal catarrh is one of the results of repeated colds during infant and child life.

Not one man in a thousand goes out of doors ten minutes of the day without taking the precaution to put on a hat. Experience has taught him that a neglect to do so may bring on a fit of sneezing, a watery suffusion of the eyes, a sore throat, headache, earache, neuralgia, toothache, and symptoms of a cold, with fever, a cough, and perhaps, pneumonia. So fully is this recognized in Europe that the custom of saluting ladies and friends by lifting the hat has been of late years greatly superseded by the wave of the hand, or half military salute.

Since the prevalence of la grippe, the risk of out-door exposure has multiplied. Many cases of severe illness, and not a few deaths have been noted from this cause. The most common occasions of danger have been during attendance on funerals, either as pall-bearers or mourners. In well-conducted funerals undertakers nowadays frequently furnish skull caps to be worn by pall-bearers. The skull cap, although it has no visor to protect the eyes, is nevertheless an efficient covering, does not offend our sensibilities, and implies no want of respect for the dead. The minister and the mourners may also be furnished with skull caps. There need be no discrimination in favor of the pall-bearers. But all reflecting persons will agree that it requires a stretch of the imagination to detect the difference in the effect between the wearing of an ordinary hat and the wearing of a skull cap on such occasions. Baring the head at funerals is a mere convention that serves no useful ceremonious purpose. Wearing a skull cap is no compromise; it is a surrender. The custom of taking off the hat in wet or cold and stormy weather while the remains are carried from the home to the hearse, or from the hearse to the chapel or lodge-room, and again when the last sad rites are performed at the grave, is fraught with danger. Ten, fifteen, and twenty minutes are not infrequently consumed, during which pall-bearers and mourners remain uncovered, while a chill wind, laden with damp, diminishes the vital resistance of the weak, and lays the foundation for a decline. The recently sick, the aged and infirm, and those who have lost the hair of the head, are in the greatest danger. But none are exempt. There are but few who, in the absence of suggestion, will defy the almost universal custom of Christian nations to uncover in the presence of the dead. Their sentiments of love, honor, and respect for the dead impel them to disregard the danger

involved by the exposure, notwithstanding a full comprehension of its evil import.

It is on such occasions that the intelligent and masterful influence of the ministry and chief officers of lodges and societies having the burial in charge may be exercised in the beneficent advice to remain covered, and avoid discomfort and danger. This can be done with neither injury nor disrespect to the dead, but with great kindness and benefit to the living. Speaking with authority, and themselves setting the example by remaining covered, they administer comfort, relief, and protection, and with certainty lessen apprehension for the results of the necessary exposure incidental to the interment.

A desire to live to a fullness of years is instinctive in all men. It is believed that the pursuance of the course herein indicated will not only be the means of preventing much sickness, but may be the means of preserving many useful lives. That the efforts to prevent disease shall at least equal, if it does not exceed, the art of cure, is one of the possible triumphs of modern civilization.

By order of the State Board of Health.

REPORT OF STATE ANALYST.

The Act creating the office of State Analyst, and defining his duties, was intended to provide a way for accomplishing the following ends :

I. An official analysis (made with the greatest care) of the mineral waters of this State.

II. A most careful investigation of the drinking waters of the State, as supplied to the larger towns and cities, and to its public institutions.

III. An examination of the food products of the State, including milk and ordinary foods.

IV. An examination of drugs, medicines, etc., for strength and purity.

V. An examination of the wines produced in the State and others offered for sale in the State, and to do such other work as the State Board of Viticulture may desire.

VI. To examine such ores, minerals, etc., as the Mining Bureau may desire.

And finally, the State Analyst was made the Chemist of the State, subject to the call of several of its important Boards, either for information, advice, or chemical analysis.

The Boards specifically mentioned were the State Board of Health, the State Board of Viticultural Commissioners, and the State Mining Bureau, to which might with propriety be added the State Board of Horticulture.

If the office of State Analyst was supported and maintained as the Organic Act contemplated, the State Board of Health would find its field for usefulness very much enlarged.

No argument need be offered in support of the regular official examination of drinking waters of the State. It is known to every person that there is no other channel through which so many disease germs enter the body. Contaminated drinking water carries disease and death to unsuspecting and helpless persons. The weak, the young, the invalid, the convalescent are the first to suffer from its concealed poison. The water may be clear and palatable, and have all the appearance of purity, and yet be injurious to health. The individual is entirely powerless to avert its evil effects. It is clearly the duty of the State to protect him in his health, and against the insidious attacks of unseen foes.

This work is being begun in a more or less efficient manner in other States. I shall make special mention of Massachusetts, because this State has inaugurated a system of good inspection, and carefully carried it into operation. The Legislature of that State has appropriated annually, for a score of years, \$5,000 to the State Board of Health, for the examination of the milk, food, and water supply, etc., of the State.

That State has done more than this. It has, within the last five years, expended \$100,000 in the special investigation of the water supply of the State. The improved sanitary condition of the State is the return for this expenditure. Massachusetts is not a State given to lavish

expenditure without reason, yet intelligent enough to know a good investment. The milk supply was improved in quality almost immediately upon the passage of the law creating and providing for a milk inspection. Year by year the reports of the Board of Health show continued improvement. There are fewer cases of suspected adulteration, and the analysis shows a smaller and smaller amount of adulteration in the samples examined. The legislation already enacted in this State makes it easy to inaugurate such a food inspection as is maintained in Massachusetts.

It is generally admitted that California has within its borders a large number and a large variety of mineral springs. These are located in wild, out-of-the-way places, and no development of these springs is possible until an analysis has demonstrated their value. The mineral springs of Germany were first examined at the State's expense, and a fund is set aside for the analysis of mineral waters within the limits of the State. Our own people visit the mineral springs of other countries, and spend large sums of money abroad, when, beyond all question, we have equally curative waters at home. For every dollar spent in this investigation of the mineral springs of the State a hundred dollars would be saved. If, added to the attractions of climate, we offer the proofs of the great value of our mineral waters, then we would attract many health-seekers who are not drawn here by climate alone. California can become the great sanitarium of the world. Too much cannot be said of the importance of the work placed upon the State Analyst. Experience has shown that nowhere can food inspection be made efficient if the State does not provide for a free analysis, and also for a systematic inspection of the same, and collection of samples.

The University of California has constructed a large, convenient, and well-equipped chemical laboratory. Provision has been made in it for the work that would fall to the State Analyst, so that it would be very easy for the State to take up this work and carry it forward with efficiency. The additional burden upon the State would not be felt. No man, woman, or child in the State, no taxpayer, would ever know or feel that this work was a burden to him. On the other hand, thousands upon thousands of the common people would be benefited by protection from disease germs, whether conveyed in water, milk, or other substances.

In view of the importance of the work to be done for the people of the State, and also in view of the small cost to the State, it is hoped that the incoming Legislature will see its way to make provision for the maintenance of the office of State Analyst.

Respectfully submitted.

W. B. RISING,
State Analyst.

RECOMMENDATION MADE BY THE STATE BOARD OF HEALTH.

The foregoing report of the State Analyst was received after the Biennial Report of the State Board of Health had been sent to the State Printer, which prevented the making of a recommendation with reference to an appropriation sufficient to meet his requirements.

The Secretary has on several occasions forwarded to Berkeley samples of water and other substances received from different parts of the State, to be analyzed and reported upon. The receipt of the packages was in every instance acknowledged by the courteous State Analyst, with the statement that it would be impracticable for him to comply with the request, inasmuch as his duties would not permit him to do it personally, and, further, that the State had made no provision for the employment of assistants. This has rendered the office of the State Analyst, so far as the State Board of Health is concerned, a nullity.

The law directs that the State Analyst shall make analyses of waters and substances sent to him by the State Board of Health, but, as it seems, no appropriation has been made wherewith it could be done. It is certainly necessary that the office of the State Analyst shall be something more than a name; and it may be necessary, in case cholera should reach our State during the next summer, to utilize the well-equipped chemical laboratory of the State University, by submitting to the State Analyst the contents of human viscera of persons suspected of having died of cholera, or of poisons administered with criminal intent during the prevalence of cholera.

This, in addition to the considerations embodied in his report, should be sufficient to show the necessity of an appropriation sufficient to meet the requirements of the State Analyst.

For this purpose, the State Board of Health would respectfully recommend that the Legislature shall appropriate \$1,500 per year for the next two years.

DIPHTHERIA; ITS COMMUNICABILITY AND PREVENTION.

By C. A. RUGGLES, M.D.

An experience of many years in sanitary matters has brought me, reluctantly, to the conclusion that great ignorance pervades the public mind regarding the origin, communicability, and prevention of disease. The existence of that ignorance is almost inexcusable, for it is plainly the duty of State and local Boards of Health to so instruct the people, so educate the public mind, that it can duly and clearly appreciate the great blessing of health and how to preserve it. In consideration of the above-stated condition, I have thought proper to present for public thought a few practical points in relation to diphtheria, which has for the past year been unusually prevalent in many parts of the State. Microscopic investigation has demonstrated beyond a reasonable doubt, that the pathognomonic feature of diphtheria, invariably present, is the specific micro-organism known as the *Kleb-Loeffler bacillus*.

The researches of *Kleb, Loeffler*, and others have abundantly proved that this bacillus is the causative agent of diphtheria, and that it produces, at the point of infection, a chemical poison whose absorption into the circulation gives rise to important symptoms. The mind of the profession has been much disturbed by the difference of opinion as to whether this disease is local or constitutional. It is at the present time almost, if not quite, universally admitted that it is, at its very outset, entirely local, and the sooner medical men come to that conclusion, and instruct their patrons as to that fact, and the sooner the disease is discovered and proper treatment applied, the better will be the prospect of saving the unfortunate patient. Though particular or specific plans of treatment are not the object of this article, yet all treatment should be based upon this one fundamental fact, that diphtheria is a local, specific disease, due to the presence and action of bacilli, characterized by a deposit of pseudo-membrane at the site of infection, accompanied by constitutional disturbances and followed by nervous symptoms due to the absorption into the circulation of a virulent agent, tox-albumin, which is produced by the local development of the bacilli. To treat diphtheria understandingly and successfully, the medical attendant must be prepared to admit that the disease is local, and the treatment should be of a local-topical character at first, for, according to the best authorities on this subject, the bacilli develop only locally at the site of infection, and are found in the pseudo-membrane only, mostly on the surface, not even in the subjacent mucous membrane. They do not invade the tissues or circulation, but generate at the point of infection this highly poisonous substance, the absorption of which produces the constitutional disturbance. If these views respecting the nature of this disease are correct, and the consensus of medical opinion is that they are, it seems as if vigorous local treatment is indicated to destroy the bacilli and prevent as far as possible the formation and absorption of

the tox-albumin. This plan of procedure is mentioned simply to forcibly impress on the public mind the great necessity of early application of treatment. When it is fully understood that the pathological element of this disease is the bacillus in the exudation, it will be readily conceded that it is communicable; that it is highly contagious, equally so as smallpox, and much more fatal in its results, as mortuary statistics show that there are ten times as many deaths from diphtheria as from smallpox. We can control smallpox by vaccination, which we cannot do with diphtheria. When the people will consent to be quarantined, and as cheerfully isolate and guard against it as against smallpox, then much will have been gained towards its prevention.

The contagiousness or communicability of this disease is now almost universally conceded by all medical men; possibly excepting a very few of questionable respectability, whose advice and counsel have done much to hinder and obstruct the efforts of Health Officers to control it, by destroying that confidence that should always exist between the people and sanitary authorities. If it is not contagious, then, they say all efforts to suppress it are unnecessarily rigid and arbitrary. One more point that I wish to forcibly impress on the public mind: That is that for sanitary purposes, at least, diphtheria and membranous croup are identical. Innumerable instances could be cited where croup diagnosed as such, treated as such, and tracheotomy performed for its relief, has given to children exposed to it, unmistakable diphtheria. My opinion is that physicians should be obliged to report their cases of croup to the local health authorities in the same manner as any other contagious disease. The public should be instructed up to the knowledge of the necessity of being just as careful in the management of a slight case as of one more severe, as it is possible for a very bad case to arise from a very mild one. Diphtheria attacks all ages. It exempts neither the nursing babe nor the adult. It appears more disposed to attack scrofulous children and those with large prominent tonsils and enlarged cervical glands, as they offer a larger field for the lodgment of the bacillus. It having been clearly demonstrated by microscopical research that the pathological feature of this disease is the *Kleb-Loeffler bacillus*, and that it develops locally only at the point of infection, it would seem our duty to tell parents to early and carefully examine the throats of their little ones, and if an unusual redness of the tonsils and pharynx be found, which may soon be followed by the development of a thin yellowish membrane or exudation, it is very good practice to resort thus early to medical treatment. Call your family physician early, believing that by attacking the disease thus in its early stage with the proper germicides before the generation at the point of entrance of the highly poisonous substance, the absorption of which produces the constitutional symptoms, much will be gained.

The suspicions of the parents having been verified by the medical attendant and the Health Officer, the most important duty of the sanitary department commences in using every known means of prevention. The strict quarantine of the whole family, children and adults, is in my opinion the only successful measure to stamp it out. In every community are people ignorant about sanitary and hygienic measures, who are not willing to undergo any individual inconvenience for the sake of improving their sanitary condition and lessen sickness and death among them. Where the welfare of the community is at stake,

individual hardships should not be considered, and the cry of violation of individual rights should not be heeded. Why should diphtheria not be as strictly quarantined as smallpox? It is in many instances difficult to carry out strict quarantine, but a Health Officer who, as a celebrated sanitarian aptly remarked, is not afraid to be cursed and sworn at daily by his profane neighbor, can, with the aid of the proper authorities, accomplish it easily enough. After proper external quarantine measures have been instituted to protect the community, we should put in force regulations for the better protection of those confined in the house with the sick one. There is no question as to the contagiousness of this disease, and it can safely be laid down as a sanitary axiom that whatever is communicable is preventable. Now, our whole aim and purpose should be to prevent it spreading. The one thing important and absolutely necessary to accomplish that end is complete and thorough isolation. A large, airy room should be selected, preferably at the top of the house and on the sunny side. An open fireplace is an advantage to perfect ventilation. Carpets, curtains, mats, and ornaments, in fact all unnecessary furniture, should be removed. A special attendant should be selected, and none other should be allowed in the sick-room. Dishes, towels, clothing, bedding, and utensils used in the room should remain there, and not be allowed to enter any other part of the house. Clothing of the cheapest kind only should be used around the patient, so that it can be burned without unnecessary hardship to parents. Soiled clothes that are worth saving should be immediately placed in a bichloride of mercury bath and thoroughly disinfected. The discharges from the nose or mouth should be received on old pieces of cloth and immediately burned. The excreta should be received in glazed-ware vessels containing the bichloride mixture. Cats and dogs should not be allowed in the room, for they are often the means of spreading infection.

The sanitary condition of closets, sinks, traps, and pipes should be closely examined and rectified if defective. The more particular and precise we are in these arrangements the more perfect will be the isolation, and consequently the safety of other members of the family the better secured. The infective bacilli being present in particles of the exudation which are coughed, sneezed, or spat up and in the saliva and mucus from the nose, readily attach themselves to the clothing of the patient or the attendants, to the walls, furniture, bedding, books, dishes, papers, or may become dry and float in the dust and air of the room; therefore, the necessity of perfect and thorough methods of disinfection, aiming at nothing short of destruction of the bacilli, is very clear. When the attending physician and the Health Officer are perfectly satisfied as to the complete recovery of the patient, it may be bathed with a weak solution of bichloride of mercury, particularly the hair, and in a clean suit of clothing may be allowed its liberty. The room in which the sick one was confined should be tightly closed and thoroughly fumigated with sulphur fumes.

It is advisable to saturate the air of the room with steam while the sulphur is burning. About five pounds of sulphur to one thousand two hundred cubic feet of air space is sufficient; the room to remain closed for six or eight hours. Then the floors, the bedstead, and all woodwork in the room to be washed with the bichloride of mercury wash, about one ounce to five buckets of water; wallpaper to be renewed and woodwork to

be repainted. It has been satisfactorily demonstrated by numerous experiments by scientists that unless there is a certain saturation of the air in the room to be disinfected, the sulphur fumes alone are useless. If you stop short of that degree you have not disinfected the room; you have simply subjected the germs to a high temporary inconvenience and left them to recover in a short time. When diphtheria is present we are frequently asked is there any way adopted to diminish the risk of infection? When one member of the family is affected, as before stated, complete isolation should be enforced at once, and parents should be very urgently warned of the danger of fondling, petting, and most particularly of kissing the sick one; as many of the family as possible, especially the children, should be sent away. If this cannot be done, a careful daily inspection of the mouth and throat should be made. Chlorate of potash gargles and tablets should be freely used to keep the secretions of mouth and throat healthy. The period of incubation is stated by many authorities to be about eight days; therefore, I would always insist that the quarantine should not be raised until the eight days have expired.

Notice of the sickness should be sent to the Superintendent of Schools, so that certainly no one from that family should be admitted until provided with a certificate from the Health Officer, who should not issue it for at least two weeks after the discharge of the family from quarantine. In case of death the funeral should be strictly private, the body of deceased being wrapped in cloths soaked in bichloride of mercury solution and placed in an hermetically sealed casket. In presenting these few practical ideas, divested as much as possible of scientific and technical phrases, to the public, it may appear strange for me to make a suggestion or give advice to medical gentlemen, but I think it well to show up the great inconsistency of some physicians who will well and truly explain to the parents of the sick one the great necessity of being very careful, so that the disease may not be communicated to others of the family; who will learnedly and very scientifically talk about the easy lodgment of the diphtheritic bacillus on articles of clothing and furniture, and tell how tenacious of life these germs are, how long they remain active, for four, five, and six months, and yet after that learned dissertation, and after having applied topically his germicides during much struggling of the patient, who coughs and spits out pieces of exudation on the hands and clothing of the doctor, will leave that patient, and, without any disinfection, or the least idea of doing wrong, visit his own family and children, or the family and children of his patrons. What better medium of communication could be desired? My opinion is that such conduct is culpable, as well as inconsistent. He should thoroughly disinfect with the best known means, and take no risks as to himself spreading the disease.

C. A. RUGGLES, M.D.,
Member of State Board of Health.

VENTILATION AND FOUL AIR AS SOCIOLOGICAL FACTORS OR MODIFIERS.

By P. C. REMONDINO, M.D.

To most persons the subject of "climate" conveys but the most indistinct and undefined idea. They are too apt to look upon "climate" as a corporate, distinct, individualized, and constant element, possessing distinct and varied specific properties, made so by what are generally considered climatic factorial elements, to wit: longitude, latitude, altitude, and surrounding physical geography. This is all very well as far as it goes, but as observed by a British author, there is a broader view, in which we must observe the subject of "climate." In touching upon the subject, he says: "In what has been said, it has been repeatedly hinted that narrow views may exist as to what goes to form *climate*, and that there may be misunderstandings regarding some of its constituents. Temperature, pressure, moisture, motion, etc., are never forgotten, though often very unintelligently considered; but there are many to whom it never occurs that there may be a *chemistry of climate*, and that airs may differ not only in such things as heat and moisture, but in the proportions of oxygen, nitrogen, and carbonic acid which they contain, as well as in the presence in them of special substances, either held in solution or in mechanical suspension. That such is probably the case, every one is ready to admit, yet practically in works on medical-climatology air is just air all the world over. It is true that for many years back experimentalists have labored to show that there are airs and airs as well as dukes and dukes; but still, even at so late a time as in the last years of his life, Dalton said that chemical experiment could not distinguish the air of Manchester from the air of Helvellyn, and it must be remembered that Dalton was equally distinguished as a chemist and as a meteorologist. Cavendish, too, could not decide that the air of London differed chemically from that of the country. Dalton was far wrong, however, as is clearly shown by his distinguished pupil, Dr. R. Angus Smith, in his recent work on 'Air and Rain.' Dr. Smith, we think, originated the phrase '*chemistry of climate*,' and in this work he gives us an extraordinary contribution of facts to the phrase."

To the ordinary observer, the labors of Dr. Smith have but little significance; but this able pioneer, in a field of science that has since been well surveyed, was actually analyzing and investigating elements which, in their presence, as to quantity and intensity, are actually the most potent sociological factors imaginable. How these elements can so act as to demoralize man and convert human beings into brutes, drunkards, prostitutes, and depraved beings generally, and how the opposite conditions can reclaim him, is the object of the following pages.

Nothing in the field of study will so show the homogeneous origin of many etiological factors of disease, sociological conditions, and many

anthropological traits, as the following of the paths of investigation marked out and first trod by Dr. Smith, and no branch of science is more broadly applicable to the amelioration of mankind. It is well to show the utter folly of attempting to treat the mental, moral, and physical natures of man from separate and differently sustaining points, because we have, more than from any other point of observation, observed the close and intimate, as well as inseparable relations, that exist between these natures of mankind, at the same time that we have seen the indestructible interdependence that we must well understand—an interdependence that unfortunately is but little understood, and but too often entirely ignored by those who desire to accomplish the most—the clergy. This is a fault, traditionally connected with theology, with which it seems to be hampered and so clogged, that it really seems as if theology and sound, rational, moral philosophy, based on a physical philosophy, could never at the one and same time hold possession and direction of the one mind. Modern theology, like primeval, ancient, and mediæval theology, will continue to cling to the divine origin as well as the divine power of cure of diseases, perversity, immorality, and devilry in general. The clergyman, somehow, feels that to give up all this will place him in an undesirable position; that much, if not most, of his power will depart from him. Uneducated minds also find it much easier to depend more on prayer and on Providence than on science for their welfare and safety, as the former takes much less study, care, and expense, and is, whilst health and life last, the least incommoding, free-from-care lives; whilst he who depends and lives up to the teachings of science has many things to look after, avoid, and remedy, that his Providence-depending brother is free from. But in return, the rational being is less prone to sickness, being less subject to typhoid fevers, diphtheria, consumption, and such diseases, as well as he is less subject to insanity or milder mental derangements, criminality, and the like order of afflictions. A mental and physical dormancy or a constitutional tiredness favor a greater dependence on Providence than on science, and as these conditions, born of laziness, are apt to continue, theology will always find a fair measure of support from the unenlightened and lazy, or obdurate-minded, and continue to flourish. If the honest and conscientious clergy, however, could once be properly started, and made to appreciate physical facts, morality would be the greatest gainer. With these preliminary remarks, we will proceed to discuss the subject of ventilation.

Unimpeded ventilation accomplishes several objects. It is not alone in the necessary aeration of the blood that perfect ventilation assists us on the road to health and long life, with a better capacity for its enjoyment, but by its free and constant action, and the thorough diffusion and dissemination of the air, it also tends to render inert and harmless those disease germs and fomite productions that are the curse of populous centers; by ventilation we either prevent or mitigate the evils that may arise from the presence of either fomites or ochlesis. The general populace believe too literally that "sufficient for the hour is the evil thereof" to worry over the fact that disease germs have an inherent tendency to a tolerably long life, provided they are protected from the light and air.

When an episode occurs like that connected with the tearing down of the fever ward in the old New York hospital, where three out of the five masons engaged died of putrid fever in a few days,* or a case of diph-

* Hospitals and their Construction, by W. Gill Wylie.

theria or typhoid fever occurs in a room which has had similar cases a year or so previously, they are necessarily struck with the fact that the disease lurks about where it has once been, without its once occurring to them that this lurking is due to a tangible explainable cause, a physical avoidable result, and just as plain as that when you sow barley in the ground, Providence permitting, you will surely gather a barley crop. The fact that an old mattress, a manure heap where the stools have been emptied, drinking or bathing water, the dust in the crevices in or beneath the floor or in the wall, or wallpaper, carpets, or bedding, may have retained and conveyed the infection,† does not connect the fact to the popular mind that all these vehicles have carefully shielded and protected the germ from the air, or that most germs have at best but a short life if freely exposed to the air, and a remarkably short one if that air be dry, warm, and sunny.

Recent experiments on the bacillus of tuberculosis have shown it to retain a wonderfully long vitality, extending for years when buried in the ground, while Koch has demonstrated that in the air and sunshine its vitality is limited to some minutes or hours. In the Crimea, the ground occupied by the French and English army became so foul that the project of reducing Sebastopol nearly came to an end without any further diplomatic or armed interference on the part of the Russians. By digging long trenches in the shape of a cross, and building fires at the intersections of the lines, the ground was drained of the mephitic gases that threatened the destruction of the troops. The shifting nomad avoids all these dangers, and, as will be explained further on, he also escapes infection from cast-off clothing, the fact of the exposure to sun and air of the clothes having destroyed all infection being one reason, and his own better aerated blood being another.

From the above it will be seen that ventilation means more than the simple breathing of a purer air. It also means less danger from infection and disease, while deficient ventilation not only prepares the body and mind for disease and infection, but it also furnishes the viable causes for the disease and infection; hence the importance of the subject in a much greater sense than the one in which it is generally considered.

The busy practitioner, daily occupied with the struggle with disease, has his attention fully taken up with the therapeutic necessities of the cases before him. He is expected to know what will relieve and alleviate in this or that case; this is all the patient asks of him; and as he may be successful in this regard, so goes his reputation as a physician. This is really all that the community expects of him. Should he refer to past events, nothing strikes the patient as of any importance, unless it be some serious physical accident or illness that may have preceded the present complaint. A business reverse, domestic affliction, or a severe mental strain, perchance a candidacy for office in some exciting election, or doing business in an unhealthy locality or unventilated apartment, may have come and gone, but to him these are of no importance; if he cannot go back for a starting point to a steamboat explosion, a railroad collision, or a "bad cold which settled on his chest," he cannot see any reason why his present illness should antedate its commencement beyond a day or two. He may have had occasional headaches, probably even some disordered vision and slight vertigo, or, perhaps, felt at times unaccountably tired, forgetful, and an inaptitude to attend to business,

† Condensed Report on Typhoid Fever, Maine State Board of Health Rep., 1889.

but these are mere nothings, in fact it was not even worth mentioning; a seidlitz powder, or a peptonic or soda-mint tablet, generally has set him all right. He does not wish you to think that there is anything serious about him, as he knows full well that there is not; if you will be kind enough to prescribe for his present ailment, it is all he desires.

So it goes. Disease is simply looked upon as something that has a spontaneous origin. The past life, trials, and exposure are supposed to have left no trace or effect on the organism, and the future is expected to look out for itself. Poor patient! he plods along in blissful ignorance that the slight ailment, headaches, or weariness are but the picket-firing of the distant outposts to warn the main body of the approach of an enemy, while he, unheeding and in fancied security, finds himself a prey to his foes. The laity are not altogether blamable for their ignorance in these matters. Our profession has not taken the pains to have them enlightened, and, unfortunately, that very occupation in which we are daily engaged, the healing and reparative art, often obscures from our field of vision that preventive branch of our science to which we must soon look as to something of paramount importance, if we wish to raise a rampart against the rapid encroachments of the physical, intellectual, and moral degeneracy which is fast undermining the great mass of the population in civilized nations.

Statistics may at times be erroneous and unreliable, but there is no mistaking the fact that nervous and morbid irritability, as well as idiocy and lunacy, are on an alarmingly rapid increase. In England alone—where statistics are reliable—since 1859 the increase has been excessive, the total of idiots and lunatics being, after making all allowance for increase of population, all of 33 per cent greater than it had been for the same period of time previously. Throughout the land, asylums, hospitals, retreats, jails, and like institutions for the physically or morally wrong are multiplying, and infirmities and depravity are increasing at an equal pace. We all admit that for certain effects there must be specific causes. To find this cause falls to the province of the hygienist and demographer. As physicians, we are well aware that a pathologist must of necessity first be an expert physiologist; he must first understand the condition of the tissues in health and their normal action to be able to appreciate when they have deviated therefrom.

Let us, for example, take the Indian of America. Catlin tells us that in all his observation, both in North and South America, he never saw an idiotic, lunatic, deformed, rachitic, deaf, or dumb Indian, either male or female; neither did he, at any time, after the closest inquiry, find a tribe that ever had any premature mortality, deaths from teething, cholera infantum, or infantile diseases; neither did the women abort or have premature births.

My own observation among the Sioux, Chippewas, Winnebagoes, and the California tribes of Indians is confirmatory of the above; to which I might add, that although I have seen many of them drunk, I have yet to see the first case of delirium tremens in an Indian.

Benjamin Ward Richardson, in an instructive lecture delivered in 1885, before the Association of Sanitary Inspectors, reviewed the relations of the nomadic or homeless people of England in their relation to health and disease. He observed among this class a peculiar exemption to infection from zymotic diseases, mentioning particularly the gypsy, whom he has seen camped in neighborhoods infected with scarlet fever

without incurring any risk, and he has never seen one marked with smallpox; these people have neither phthisis, scrofula, or any kindred diseases. From my own observations I do not remember ever seeing a feeble-minded, idiotic, or lunatic gypsy.

If, in a family of six, we were to find three who had partaken of some particular article of food, who were very sick, and the other three who had not touched it well and uncomplaining, we would be safe in assuming that the particular dish was the cause of the sickness in the first three. Now, if one of the well ones should accidentally or intentionally eat of the same dish, and likewise sicken and present analogous symptoms to the other three, we then would have conclusive evidence that this dish was the real and only cause of the disturbance.

If we apply the same rule to the general physical conditions, we find that barbarous and nomadic people were all in the enjoyment of the best of health; that finally a portion became civilized, and then began to house themselves in; that with this change in their habits and customs also came ill-health, physical and mental ailments, and general degeneracy. We notice further, that those who still follow the old nomadic habits retain their health and enjoy exemption from disease, but we also observe, that whenever any of these adopt the customs of the civilized man and go on and house themselves as the others have done, they sicken, and that their children become like the children of the close house-dweller—a prey to all kinds of ills and to premature mortality. That the change from an out-door to an in-door life is the cause of the departure of health is self-evident, and still better confirmed, when the close house-dweller partly resumes the more open-air life of his ancestors and is found to have regained lost health and exemption from disease. It needs neither bacteriology nor the pathologist to confirm our deductions.

Some years ago an Indian agent built a number of farm-houses for the Indians in his charge. What was his surprise, when on a visit some time subsequently, to find the house littered with the harnesses, plows, saddles, with other farming implements, and the Indians camped at a safe distance in their tent. On inquiry, the Indians told him that the house had made them all sick, and that some of them had even spat blood, and that they had moved out and were now all right.

There can be no doubt that the difference in health, depravity, and mortality that exists between strictly nomadic people, uncontaminated by border civilization and civilized man, can be attributed in a great measure to mode of habitation, as we find that those who live in large and well-ventilated houses, or whose occupation keeps them out of doors, and where the climate allows of free and constant ventilation at all seasons, that the people more nearly approach the state of perfect health enjoyed by the nomad.

Popular opinion on the subject is very crude. The majority have in some manner a vague idea of a carbonic oxide that kills, and some of the better informed will tell you of the Grotto del Cane; they have also some idea regarding the favorite Parisian mode of suicide; and they are not astonished at such occurrences as that of the Black Hole of Calcutta, the ship "Londonderry" with its seventy-two dead in the steerage, or at the English sloop that smothered all of its seventy passengers between Jersey and Southampton; they also know that they should not venture where a candle will not burn. In my opinion it is the erroneous views

that they hold that prevent them from really and fully realizing that there are unseen dangers in unventilated apartments besides mere unrespirable air, and that the cause which daily places people where they are sure to suffer irremediable injury is their lack of knowledge concerning the real dangers. They rely for safety on the fact that the light burns brightly in a certain atmosphere, and that therefore they run no danger, the burning taper being their criterion of the respirable condition of the air. The laity should be taught, what De Saussure long ago demonstrated, that the fresh, invigorating, effervescing mountain air contains a greater percentage of carbonic oxide than the air of the plain or seashore, and that on a bright day the air of a London or New York park actually contains a less percentage of carbonic oxide than the air of the Catskills or the hills of Scotland. They should realize that carbonic oxide is not inimical to life, but only cannot support life; and that persons going into a carbonized air that will hardly support a candle alive, have actually at first not even found it objectionable; and that but in a few isolated instances this is the last source of danger from unventilation. We are not now speaking of the absence of oxygen, but only of impurities that mingle with respirable air. They should also understand that any injury, or even asphyxia, that may result from the presence of carbonic oxide gas in excess—that such sickness is quickly recovered from, provided the condition is not pushed too far. Where there is danger, however, the calamity occurs suddenly, and where the recoveries are made, they are as prompt.

As has been pointed out by Brown-Sequard and D'Arsonval, the morbid element in respired air is the pulmonary emanations, to which they might have added the perspiratory effluvia. The great delineator of the human passions and frailties, Shakespeare, has well depicted the effect of this effluvia from skin and breath in his "Julius Caesar," where the rabble so yelled with a deal of stinking breath and threw up their equally stinking, sweaty night-caps, when he refused the crown, that it caused Caesar to faint and Casca to hold his breath for fear of taking some of the poison into his own lungs.*

The best account of the effect of this organic poison is from the pen of Dr. Holwell, one of the twenty-three survivors who escaped alive from the Black Hole. His account, written in 1757, fully shows each step of the action of this intoxicant and narcotic poison, which, after many hours, left him still conscious, but "sensible of no pain and of but little uneasiness, with a stupor coming on apace, in which condition I laid down to die in peace, and gradually became unconscious." The maddening, intoxicating phrensy of men, as described by Holwell, cannot be ascribed to the mere fear of death, as British soldiers have met death, going down with dressed ranks in a foundering troop-ship that confusion might be avoided and the women and children saved. In that tempest and storm-tossed ship, however, there was not that poison from animal effluvia accumulating in their blood like fusel oil.†

Hutchinson well observed that "we unwisely neglect the study of the differences that exist between man and man—a difference that, for the most part, physiology takes little cognizance of, but which may prove of much importance in modifying the processes of disease."* In our zeal to

* Julius Caesar, Act I, Scene II.

† Family Physician, chapter on Hygiene, published by Cassell & Co., London.

* The Pedigree of Disease.

master or to carefully study the disease, we are so apt to make it a self-consistent condition, and become so absorbed in our research, that we are apt to lose sight of first principles. Hutchinson deplores this tendency; and Richardson—in speaking of our classification of disease as “unsystematic and fanciful, and its nomenclature imperfect, even for the technical purpose of language, and inapplicable for the higher development of medical scientific research and practice”—also felt that we were drawing away from first principles.† Were we to keep in mind that heredity is only an acquired or cultivated habit; that, as our forefathers in the days of Tacitus roamed through the forests of western Europe without aid of spectacles, the physique of the German, Gaul, Goth, or Briton was the admiration of the warlike Romans, whose superior arms and discipline alone enabled them to overcome them; and that these men had neither gout nor phthisis—we could not reasonably say that we owe our infirmities to their simple, martial, out-of-door life. Heredity must, therefore, have had a subsequent origin so far as our diseases are concerned, and, as they do not originate spontaneously, where did they begin? Morel, in his work on the degeneracy of our race, places toxæmia as a primary cause.‡ Toxæmia has several sources from which it may result, and a careful study into the original cause of diseases will generally result in establishing the fact that outside of those originating in a specific disease germ, some form of toxæmia is generally the starting point of sickness, and that even most of the other diseases that owe their origin to, or that can be propagated from, a bacillus often themselves have their primary birth in toxæmia, whether it be from over-feeding, uræmia, or infection from the emanations of respired air, or from some animal or vegetable decomposing matter. From whatever source it may come, it often produces precisely the same results.

In a paper read before the Southern California Medical Society, entitled “A Plea for Circumcision,” I showed that one of the main dangers or results from reflex irritation lies in the toxæmia that it may induce. In the paper mentioned, I followed the different reflex processes due to phymosis up through to the obstinate and irremediable constipation due to sphincterismus, a condition described by Agnew,§ of Philadelphia. In following up the different steps that the condition assumes, I showed the immense importance that Sir Lionel Beale attaches to blood composition as the ground-work of health or disease, wherein he truly observes that “blood changes are the starting points, and may be looked upon as the cause of what follows,” the other factors being the “tendency, or inherent weakness or developmental defect, of the organ which is the subject of attack.” To which he adds, that he feels convinced that if only the blood could be kept right, thousands of serious cases of illness would not occur; while the persistence of a healthy state of the blood is the explanation of the fact that many get through a long life without a single attack of illness, although they may have several weak organs, and that an altered state of the blood, a departure from the normal physiological condition, often explains the first step in many forms of acute or chronic diseases.* Sir Lionel might have added that the “tendency or inherent weakness or developmental organic

† Diseases of Modern Life.

‡ *Traité des Dégénérescences Physiques.*

§ Agnew's Surgery, Vol. I.

* Beale. Urinary and Renal Disorders.

defect," which, after all, is all the foundation or ground-work for the hereditary diathesis, is itself the outgrowth of transmitted toxæmic tendencies, or conditions affecting former generations, or of previous toxæmic results in the individual itself, as we can safely assert that our fathers, of barbarian memory, left us no inheritance of developmental organic defects. The daily increase of these physical defects shows plainly that they are so, not from inheritance, but from present causes or cultivation, as well as it plainly explains that toxæmia lays the tendency to reflex troubles, also on the increase, which in turn favor further toxæmia by the disturbances, deterioration, and morbid sensitiveness that they occasion—the retroactive effects of either good or bad physical condition being here fully exemplified. Fothergill shows how this condition of blood, whether due to reflex irritation, unventilation, or overfeeding, or from mental disturbances, eventually results in uræmic difficulties which engender kidney disturbances, notably Bright's disease, and that instead of these diseases being the cause of the uræmia that finally takes off the patient, the uræmia is the real starting point of the kidney disease, which goes on until such structural change has been effected that we reach that point where the kidney is no longer equal to its functions—the renal inadequacy of Sir Andrew Clarke.†

In the Bradshawe lecture, an extract of which appears in "Braithwaite" for January of 1889, William Carter observes as follows: "According to Bouchard, one fifth of the products of the total toxicity of normal urines is due to the poisonous products reabsorbed into the blood from the intestines, and resulting from putrefactive changes which the residue of the food undergoes there."

One of the changes that full respiration in the open air effects in the blood is the destruction of these toxic elements. This is mentioned for the purpose of explaining the intimate relations that exist between all the causative conditions, physiological or pathological, that tend to induce toxæmia. The large-lunged and deep-chested Indian will eat at one meal as much food, indiscriminate as to quality or state of preservation or of putrefaction, as will an ordinary white man for three days, or even a week; but toxæmia, with the attending ills, does not find in the Indian a favorable resting-place, so that after the most gourmandizing meal he is in no more danger from toxic absorption than he is from an attack of delirium after the most generous or protracted drunk. Former perfect aeration of the blood has not left him with any developmental organic defect in the minute structure of his organism, and the present perfect condition of his respiratory apparatus oxidizes and works off into the outer air all the toxic products that are brought to it. He needs neither pepsin nor naphthalin to insure him against toxic accidents.

It is evident that we have different sources by which the blood can be charged or overcharged with toxic products, but it must remain fully as evident that nature has given us the organs of respiration for their elimination. The skin and kidneys are depurative mediums, and very important channels it must be admitted, but we must not fail to recognize that they are not the chemical laboratories that the lungs represent. It matters not if all the chemical changes do not take place in the lungs, it is through the lungs that the agents are taken that must bring about the changes; and, after all said and done, it may safely be assumed that

† J. Milner Fothergill, in *Satellite*, February, 1889

imperfect blood depuration is the starting point of ill health, either physical, mental, or moral, for what matters it whether you have a pneumonia or phthisis, or are even insane owing to a cardiac derangement, or are insane from uræmic retention due to Bright's disease, or you are laid out racked with gout, rheumatism, and allied disorders, or are even watching the slow approaches of grim death through the slow process of senile gangrene, with an amblyopia that even robs you of the comfort of reading, and distraction, we must in every case go back to the primary cause, which will always be found to be toxæmia. It is always imperfect blood depuration that is the *fons et origo mali*.

To what fine distinctions, differences in condition of health or disease may be due, after the developmental defect or inherent tendency has once been established, and to what trifling circumstances a person may attribute his particular point of divergence from health, may be inferred from the fact that even in an apartment where the ventilation may be equal in all its parts, a particular form of task may so affect the breathing organism by strengthening or weakening the organs of respiration that a statistical difference in the health of each class will be noticed. For instance, Lombard long ago furnished statistics that showed that the copyist was much more prone to phthisis than the bookkeeper or accountant,* the steady, unmoving work of the former occupation making the difference; the typesetter in a printing establishment is much more subject to the same disease than the pressman.

Another condition of affairs which must not be overlooked in this connection is the fact that the predisposition or tendency-causes do not by any means cease with the departure from the office or work-room, for the better developed muscles of the chest, in the pressman or ordinary and more active clerk, when in the outer air, so work as to more effectually empty the lungs and aerate the blood, while in the copyist and typesetter, as in the mosaic worker, they are weak and undeveloped, and but ill perform their functions, so that even when in the outer air, owing both to lesser chest capacity and feebler respiratory movements, aeration is never as perfect; so that either in the house or out of doors he loses more ground in the physical scale than the other classes. I have purposely taken the extreme illustration, where, however, statistics fully support the proposition, to show that the physiological working condition of the respiratory apparatus cannot all be overlooked, and that all does not depend on sanitary architecture.

There is much in popular errors that helps to bring about our condition of physical degeneracy; for example, people look upon cold as their great and dreaded enemy, whereas cold, unless in an extreme degree, does not and cannot hurt any one primarily. To shut out the cold, which is harmless, they shut themselves up with ochlesitic poisons, as moribund and fatal in the end as the effects of alcohol or fusel oil. They have a vague idea that "catching cold" is to be avoided, but they have not the least idea of the lasting poison of ochlesis or in fomites. A man will give a friend a wide berth during the critical period of typhoid fever, but as soon as that period is passed, he and his whole family will troop into the room, in blissful ignorance of the researches of Uffelmann and others into the wonderful tenacity of life possessed by typhoid bacillus; or, so that they avoid the immediate breath of a consumptive, they live in fancied security. That this infection, as well as that of typhoid and

* L'Influence des Professions sur la phthisie pulmonaire.

other disease germs, is longer lasting in a dark or north room, is not of any importance. The lady of the house, on the departure of her consumptive visitor, will at once draw the curtains and close the windows of her parlor that the light and dust may not affect her carpets and bric-a-brac, perfectly unmindful that the care she bestows to protect these things she may do at the expense of the health and life of a son or daughter; she does not know, nor has she taken the pains to learn, nor has any one undertaken to instruct her, that the bacillus of such diseases as typhoid fever, diphtheria, phthisis, and most diseases which have a specific germ, cannot exist and hold their identity in solar light and air, which, as has been demonstrated by Koch, kills them in from a few moments to a few hours, which leaves no room for doubt that, by the construction of our houses and by the studied exclusion of light and air, we do most for the retention of these disease germs, and at the same time contribute to the preservation of their vitality. I have alluded heretofore to the injury that deficient ventilation does to humanity in producing toxæmic conditions; we now see how the same deficient ventilation tends to maintain germ infection.

It is probably in a bird's-eye view of the many phases that the pathology of phthisis has at different times assumed, and of the various forms of treatment that these changing views have inaugurated, that we see how and wherein the importance of ventilation to life has been so shamefully neglected, how, as it were, in the general advance of knowledge, as in a line of battle, the too rapid advance of one portion has risked the fate of the battle. The study of the etiology and pathogeny of this disease, and the wonderful discoveries of Koch, and the many ideas in regard to its pathology, etiology, or pathogeny that have been advanced here and there, have all absolutely been instrumental in obscuring from us the fact that air and sunshine are its preventives, and that it matters little what therapeutic means we may call to assist—that unless we add plenty of fresh air and sunshine, all our efforts are ineffectual.

We can easily observe the ludicrousness of the appearance of the legs of the Pope's body-guard in their variegated coverings; but we must certainly admit that it is more ludicrous to see a patient going in one direction to have the air pumped out of a cabinet wherein he is to sit, on the Jourdanet idea of an artificial Anahuac climate, and that rarefied air is the proper thing, and another going in another direction to be inclosed in a Pravaz pneumatic cabinet of compressed air where air will be pumped into the cabinet.

It is very evident that Jourdanet failed to grasp the plain truth, in not observing that it is neither the altitude, barometric reading, nor rarefied air that gives the Anahuac plateaus and the Columbian or Peruvian Andes that exemption from phthisis, any more than it is the depression below sea level and compressed atmosphere of the Kirghis steppes, the valley of the Jordan, or of the desert of the Colorado in Southern California, that exempt their dwellers from the same disease—any more than filling the lungs with a gaseous compound by the mouth or the colon per rectum by chemical gases at regular intervals could keep an Indian from having phthisis if suddenly taken from his native plains and housed in an average boarding-house. The Tartar of Kirgheeze and the Peruvian Indian of the high Andes need no rubber bag of gas with a rectal tube, microbe-killer, or medicated woolen garments to protect them from phthisis; and the microbe or bacillus that finds its

way into those Peruvian homes—which Americans find so peculiar that people sit in the chilly air with their shawls without having sense enough to close the doors—finds a short existence.

Davis, a former Governor of the British colony in Hong Kong, in his work on the customs of the Chinese, tells us that, among the higher classes, when a visitor arrives, he finds a ventilation in their large and open apartments equal to that out of doors, but that the host has generally a large assortment of furry coats which are handed out something like napkins at an afternoon tea; with his other hospitalities, the Chinese gentleman sees to it that his guest's health is not ruined in his house.* It might be added that the free use of weak and tepid tea, in which they all indulge, acts in no small way as a preventive of uræmic accumulation, for without going to the extent advised by Sangrado in Gil Blas, there is no doubt that many of our people, considering the amount of food they consume, take hardly enough fluid to assist proper blood depuration.

The example of the Chinese in regard to ventilation and hospitality could be ingrafted into our civilization with benefit not only to our health but to our morality. Some may perchance think that with the indiscriminate use of these garments, diseases would be more and more disseminated. This would not be the case, however. In the first place, there would be less diseases; and secondly, Richardson, as already observed, has shown that vagrants who deck themselves out in cast-off odds and ends of clothing, which are often infected, hardly ever receive any harm from the clothes, the sun and air having effectually slain all the bacilli or disease germs. I cannot see why the profession cannot accept the fact that pure air and sunshine are the preventive agent, as well as the curative means, in phthisis, and drop all of those makeshifts with which they torment themselves and the patients, such as the hot-air treatment with which some undertake to circumvent the wily bacillus.

Gout and rheumatism, as well as asthma, owe their origin to deficient blood aeration much more than is generally believed. The classic attack of gout suffered by Sydenham when composing his work on gout, as well as that other attack suffered by John Brown, equally as classical, but more important, as it was the keynote to a revolutionary movement in medicine, and an inauguratory point for the conception of the Brunonian doctrine of *sthenia* and *asthenia*, were undoubtedly due to the weakened and imperfect respiration that at the time affected those two beacon-lights of medicine. The English Hippocrates was no doubt absorbed, and writing with bated-breath his dissertation on gout; and from Brown himself we learn that he was weakened down and below his normal condition of health at the time.†

Loomis writes, in his edition of "Charcot on Diseases of Old Age," of a Confederate officer in whom the gout was developed by confinement in an unhealthy and damp prison, with insufficient food;‡ and is it not a generally known fact that Holwell, already mentioned, suffered from a severe attack of the gout in one foot a few days after his liberation from the Black Hole?§

* The Chinese, by J. F. Davis, F. R. S.

† Brown's Elements of Medicine, Preface.

‡ Wood's Med. Library, Vol. June, 1881, p. 91.

§ The Family Physician, Cassell & Co., Vol. IV, p. 971.

I have seen instances of gout developing under similar circumstances, notably the case of a physician accustomed to an out-of-door life, who found himself confined to the bedside of his child afflicted with measles; he never left the little fellow's bedside, and the room was kept closed. On the recovery of his son he suffered severely from his first attack of gout. Although his family has no gouty or rheumatic history, they being long-lived, hearty people, one week of close air developed a disease that may require generations of careful watching and pure air to eradicate from the family should he have any more children.

On the other hand, the case of the rich and gouty old priest, observed by Van Swieten, and mentioned by Fothergill in his work, § is very instructive. Here was a cheerful old gentleman of the old school, a good liver, who took but little exercise, well fed, and taking his after-dinner naps in a room carefully closed to exclude the heat and flies of summer and the cold of winter. We may rest assured that he used his respiratory muscles but to very little purpose, probably never taking a deep respiration, unless after his social pinch of snuff with the burgo-master, which undoubtedly induced a healthy sneeze. His capture by Barbary pirates, who took no stock in full meals and after-dinner naps in close rooms, cured him of his gout; the fresh sea air and the deep inspiration required properly to propel a galley oar furnished a medium through which a complete oxidation of the urea took place, and an efficient exhalation of all toxic material.

Professor Marfan, of Paris, has related the occurrence of what might plainly be called an epidemic of phthisis, where one consumptive in an atelier, by promiscuous spitting all over a rough floor, so managed to infect the rest of his twenty-two fellow-workers that in six years after his own death they began to die rapidly, until fifteen out of the twenty-two were gone. Marfan and Vallin laid the blame on the character of the floor and the sputa infection; the old floor was removed, the apartment disinfected, a new, well-jointed, and smooth floor laid, and the epidemic ceased.* Cases like the above, but not so extensive, are common enough to make us feel a wholesome dread of the bacillus, regardless of what contrary opinion others may hold, and founded on ever so many experiments. But this does not alter the fact that we have depended too much on the bacteriological origin of phthisis. Where one person becomes phthisical through the bacillus, there are a dozen that have become so without coming in contact with it. And while in our zeal we have pursued this branch of our science, we have closed our eyes to the fact that deficient ventilation is the most prolific source of phthisis, regardless of the presence or absence of the bacillus. We are getting to depend altogether on the bacillus, which, like Falstaff's men in buckram, is multiplying and fast becoming the cause of every form of disease.

Another incident wherein the bacillus is made to usurp deficient ventilation as the cause of a disease, is the lately discovered fact that a bacillus has been recently found in connection with trismus. To attribute the origin of trismus to any bacillary cause we must altogether ignore all that we know of the disease. If the literature on the subject were scanty, or obscure and indefinite, and the observer incompetent, and our experience in its connection unconclusive, we might begin to doubt; but such, however, is not the case. The literature is very intelligent,

§ Gout in its Protean Aspect, p. 164.

* Boston Med. and Surg. Jour., Vol. 122, No. 18.

authentic, and exact on the subject. The work by John E. Morgan, F.R.C.P., entitled "The Diseases of St. Kilda," devotes much intelligent explanation to the cause of trismus. Morgan was a close observer, and noticed that the disease did not prevail on the neighboring Hebrides. In his search for a cause, he observed that a like equable, mild climate affected St. Kilda and the Hebrides, but he noticed further that while in the latter islands the inhabitants live in the Scotch bothies, such as are found on the Scottish coast, built of loose rock and stone, with plenty of crevices and an open chimney, those of St. Kilda were built of rocks, but closely cemented at every joint; and that although, as in the other islands, a peat fire is used, the cottage or hut has no hole for the escape of the smoke. On inquiry he found this difference in custom to be due to the scarcity of seaweed on the St. Kilda shores. On the Hebrides, either owing to different winds or ocean currents, the weed is plentiful, and is used for manure, while at St. Kilda the soot that has gathered on the walls and under the roof is scraped off in the spring and used to enrich the fields. To allow this soot to collect the house is kept carefully closed. Doctors Morrison and Maxwell, who practiced in the West Indies, attributed the existence of trismus in those islands to the confined and smoky condition of the houses. The same may be said of the negro huts on the Florida and Georgia coasts where trismus has been observed, and lastly, the experience of Joseph Clarke, and subsequently of Collins, in the Dublin Lying-in Hospital, where by continually improving the ventilation the trismus epidemic was checked, would seem sufficiently to prove the foul air origin of the disease.

On the other hand, it must not be overlooked that want of ventilation will engender very infectious and contagious diseases. Dr. Parry, in discussing other subjects, says: "It may be stated, as a general proposition, that all living bodies, when crowded together, generate a matter which would seem to be highly destructive. No species of animal can congregate in ill-ventilated apartments with impunity. Under such circumstances, the horse becomes infected with glanders, fowls with the pip or pep, and sheep with a disease peculiar to them, if they be too closely folded. It is worthy of remark that these diseases, evidently engendered by congregation, become subsequently contagious. In the expedition to Quiberon, in 1795, several transports, crowded with horses, had their hatches shut for a considerable time in a storm, by which some of them were suffocated, and amongst the surviving horses the contagious disease called glanders was propagated. At another period it was proposed to send livestock from England across the Atlantic, but the animals all died of a febrile disease in a few weeks, in consequence of being too much crowded." From this we may readily see that the ill-effects of unventilation are more far-reaching than generally believed, and we can as readily perceive how the same cause may engender serious organic disease in men. Furthermore, we cannot escape the conclusion that it is not alone the individual sufferer who may be the victim, but that a violent contagious or infectious disease may, from such a small beginning, nearly depopulate some countries. Asiatic cholera but too often has such a possible factor.

Maudsley has well said that the mind is the most dependent of all the natural forces, and that for its existence all the lower natural forces

are indispensably prerequisite.* The time has gone by when the mildly lunatic was tortured, hung, or burned at the stake as a criminal, while the phrensiad, raving maniac was either chased about like a wild beast or considered as a demoniac and deluged with holy water and prayer. Pathology has here opened up a study that has not yet fully brought out all its fruits. Liver abscesses, or empyema, is now known to derange the mind as much as we realize that intestinal irritation will produce night terrors. Readers of Silvio Pellico's "My Prisons" will not forget his graphic description of the hallucination that he suffered while confined under the "leads," or leaden roof, of the ducal palace at Venice, finally relieved by what must have been the spontaneous discharge of an abscess into the intestinal tract, when all the mental disturbances at once left him. It is also a recognized fact that uræmic retention holds a very close relationship to insanity, Dr. Alice Bennet showing, in a paper read before the Pennsylvania State Medical Society, the connection between it and Bright's disease.† The connection between the habitual or excessive use of stimulants and the development of insanity is too well acknowledged to require more than mere mention, except that we may add that it is among the lower classes who use the excess of liquor that we find the greatest amount of lunacy, and observe further, that which has been more than once suggested in the course of the paper, that by insufficient analyses of our subjects we oftentimes connect and mingle coexisting effects as cause and effect, and often place a result as a primary cause. In this respect we must not forget that among the poor there is an inherent tendency to infirmities, mental and moral, as well as physical—a condition due to the deterioration caused by want, lack of proper nourishment, anxieties, suffering, and lastly, but not the least, the foul air which they must of necessity continually breathe. Liquors and stimulants are the causes to which all the miseries and physical as well as mental afflictions of the poor are attributed—as if poverty itself were no misery, and did not carry in its train sufficient ills aside from the use or abuse of alcohol! The premature mortality so excessive with the poor, their ailments, feeble-minded, rachitic, or consumptive children, depravity, moral degradation, idiocy, and insanity—in fact, all that may happen, either in the line of physical or of moral degradation, is attributed to alcohol. Alcohol with them has become a necessity, owing to the morbid condition induced by foul air.

A reviewer of Acton's work on prostitution mentions the swarms of child prostitutes that infest the low quarters of London, whose existence he attributes to a "brutal stupefaction of the moral senses, resulting from an utter ignorance of what is good or evil." Were I to review the reviewer, I might ask how ignorance can cause brutal stupefaction of the senses, either moral or otherwise. In the present age, we fully understand that for all effects there must be a specific, self-sufficient cause. It may not be found at once, but we should neither jump at a conclusion nor cover our ignorance in the matter by a mere figure of speech. Saying that their mothers drank alcoholic liquors, and that precept and example have lowered and debased them, even if they are too young to have drunk themselves, does not satisfactorily explain the existence of the swarm of child prostitutes, or how they arrived at the stupefaction of the moral senses. My own opinion is, that on alcohol

* Maudsley. *Physiology and Pathology of the Mind*.

† *Med. News*, Oct. 4, 1890.

we lay the blame so that we may not blame ourselves for the indifference and neglect of the human family in our immediate neighborhood: it is a certain relief to the conscience to say that they drink—drink has brought it all on them: we then wash our hands, like Pontius Pilate, and the Passion Play goes on. Drink, however, does aggravate and precipitate many conditions that the poor have in them with a strong inherent tendency. Every practitioner knows that among the children of the poor, living in crowded tenement houses or basements, there exists a disposition to convulsive and nervous diseases, as well as that they are more subject to zymotic diseases; and that, too, where the parents are habitually sober. Nearly every physician who has had such practice has often wished for the wealth of a Vanderbilt or a Jay Gould, that he might relieve the poor, patient, anæmic little children who seldom see any joy, and who seem from birth wedded to a life of misery. The question has often occurred to me, while looking on these helpless children, is it possible that the philanthropist and statesman are unacquainted with the effects of foul air? That such an air, which will give an ordinary gentleman, accustomed to well-aired rooms and fresh air, a headache that will last him all day, or even produce in such a man an illness, must be poisonous, no one will doubt.

In a concentrated accumulation this foulness has shown serious results besides the Black Hole and other such episodes. Guy, in his work on Public Health, quotes from Sir John Pringle, in connection with the work of the philanthropist, John Howard. He there relates that in the May sessions of 1750, at the Old Bailey, forty persons perished from putrid fever, caused by breathing the foul air that issued from the jail-room and prisoner's dock; of this number, four were Judges, and the rest officers, barristers, and jurymen. That was an extreme case; but I have often visited sick children in rooms and beds, where between the fumes of cooking, the over-heated room, and the steam from drying clothes, added to the exhalations of half a dozen large-lunged human beings, the room was so offensive that I made my visits very short. This air has precisely the same effect as alcohol or fusel oil, and the slow, steady effect on the nerves of the susceptible little child is to create a morbid irritability which later calls for alcoholic support. The little bodies of these poor children have no more resistance, strength, or endurance than their little brains; they are morbidly sensitive, and age early; want has developed a precocious sharpness of instinct, and the foul air that has poisoned their young blood has precociously matured their sexual organs, while the rest of their physique lacks development. Foul air is more than sufficient to cause all these conditions without the assistance of alcohol either in the child or its parents. It is the foul air that produces that "brutal stupefaction" of the moral senses before alluded to. In one London parish, out of eighty little girls raised in its work-house, seventy-nine were afterwards found, on an investigation, to be on the street,* and Dr. C. F. Taylor relates that in one New York asylum for feeble-minded children, fully two thirds of the children masturbated, the proportion being about equally divided between the sexes. By careful investigation it developed that among these feeble-minded children the habit came by intuition—the morbid excitability of the sexual organs being the cause—without assistance from either precept or example. The girls were found to begin at the age of eight, and the

* A Home for the Homeless, by the Hon. Mrs. Wray.

boys at ten.* Society and the State furnish millions for the suppression of the depraved class, when a tenth of the sum would effectually prevent its formation.

The unnamed author of a remarkably instructive little work† on ventilation in its relations to life and disease, makes the following true observation: "The combined testimony of those who have taken the pains to investigate the causes of vice and prostitution leaves no doubt that a low condition of body and mind, coincident with a morbid irritability of the brain, so far from restraining (as might be surmised) the animal propensities and vicious inclinations, has no inconsiderable share in their aggravation and production." The effect of foul air on the brain has been well depicted by James Johnson, in connection with the death of Mr. Justice Hays, who was stricken with paralysis and apoplexy after a day's sitting in the foul air of a court-room. "The blood," observes the doctor, "imperfectly aerated, and charged with the exhalations from numerous lungs breathing the same atmosphere, is impeded in its passage through the minute arteries, whose muscular walls contract and hinder its progress. Hence the sense of fullness, pain, and throbbing in the head, while the heart beats with increased force to overcome the impediment and to drive on the blood."‡

Dr. Johnson's labors in the field of renal diseases are well known, and he explains in the above the cerebral action of impure blood, a subject with which he is perfectly familiar. It is preposterous to imagine that the delicate brain and nerves of a child can stand the continued effect of such a poison without harm; and civilization can only plead ignorance as an excuse for its sin in the way of omission, in thus neglecting the child and allowing it helplessly to grow up food for the jail or the gallows. Were the clergy to study physical causes and effects more, they would see that the first principle to be instituted to obtain a moral man is perfect sanitation, without which all mission work and sermonizing might as well be made to the four winds.

As a summary of what has been advanced in the foregoing paper, it may be stated that it has undertaken to show that the visible point of departure from a condition of general good health and an unimpaired organism is plainly where the nomad diverges from the free, out-of-door life of his ancestors, and incloses himself within four walls and a roof that exclude the sun and air, and retain his own exhalations. Prior to this occurrence we can find no history of developmental organic defect—neither inherent tendency in any organ or part to disease, to morbid irritability of body or mind, or tendency or liability to reflex troubles of any kind. That ventilation is the prime factor that induces this wonderful moral and physical perfection by allowing the aeration of the blood to be fully carried on as the Maker intended, is evident from the fact, as cited by Hirsh, that there are populous industrial centers on the high plateaus of the Andes, cities of from twenty thousand to three hundred and twenty thousand inhabitants, where the bacillus tuberculosis does not seem to thrive or find a lodgment; so that mere density, industrial pursuits, or civic aggregation cannot be said to be the cause of the physical degeneration observed elsewhere. The secret of the exemption in these communities is found in the simple fact that either in August

* Am. Jour. of Obstetrics, Jan., 1882, p. 163.

† House of J. S. Redfield, Clinton Hall, N. Y., 1849.

‡ London Lancet, Dec. 11, 1869, p. 824.

or January the thermometer marks 60° F.; that their houses are never closed at any time; if they feel chilly, they simply put on an extra shawl or poncho, *but they do not close the door*. It may also be stated that these localities are not financially drained to maintain swarms of idiots, lunatics, rachitics, crippled paralytics, criminals, or prostitutes, either in reformatories, asylums, hospitals, or jails. Such are the facts, and we can draw our own inferences. One thing is certain, that these people literally live out of doors.

The erroneous opinions of the public in regard to the effects of good or bad ventilation have next to be considered. That ventilation does not receive the consideration that it deserves from the public, is undoubtedly due to the reason that they misapprehend the really dangerous element that lurks in non-aerated rooms; further, they lack the appreciation that there exist gradations in effects proportionate to the causes. They can, as a rule, only appreciate extremes of conditions. That each intermediate fraction of space between a sane man and a phrensied maniac can be accurately filled by a specimen representing each gradation cannot be understood by them, any more than that one gradation leads to the other. Neither can they understand why there should be preparatory processes to the inception of a diseased condition. When the poor consumptive asks you simply to give him something for his pain in the chest, or to stop the cough, or to arrest his night-sweats—it is all that he wants; stop that and he will be all right—it fully shows the popular idea of disease and the popular appreciation of the processes through which the body must pass to reach certain stages or conditions. It cannot be said of them, as the French said of the returning aristocracy in 1814, “They have learned nothing, but they have also forgotten nothing.” Through civilization our people have learned nothing of benefit to their health, and they have lost that instinct for fresh air so dominant in nomadic tribes. Oswald relates that when the Circassian chief Shamly-Ben-Haddin was captured by the Russians, in 1864, he offered his captors the best part of his rations and all his personal valuables for the privilege of sleeping in the open air, feeling that one week more of the nausea and headache consequent on his sleeping indoors would drive him to suicide. General Houston, who spent his life among the Cherokee Indians, never could endure a close room or a crowded hall for more than a few minutes. As our people have forgotten or lost these instincts, they should be instructed as to their danger. With no knowledge or instinct in so important a matter, it is not surprising that they so often come to grief.

There is no reason why they should not understand that the strength and endurance, health and expectation, of life must be measured, like a chain, by the weakest link, and if that one organ be enfeebled, the apparent health and strength of the other only hastens the destruction of the whole, for, as George Murray Humphry observes, it is requisite to longevity that “each organ must be sound in itself, and its strength must have a due relation to the strength of the other organs. If the heart or digestive organs be disproportionately strong, they will overload and oppress the other organs, one of which will soon give way. One disproportionately feeble organ endangers or destroys the whole.”* If the laity could be made to realize that between lasting and enjoyable health, and sickness and lingering misery, there is but a shallow and an almost

* Humphry. Old Age.

imperceptible Rubicon to be crossed, whence there is no returning except on a compromise made by running the whole machine on the basis of the weakest organ, and that one hour spent in a close room may be to them that Rubicon, much more attention would be paid to the importance of ventilation. The writer has seen, more than once, a child born perfect and sound, but one half hour's overheating in a close room, by an over-solicitous nurse, produced a nasal stenosis that has followed the child into adult life, with the anæmia and all other ills that accompany such a condition of affairs, changing the temperament and constitution completely from what it would otherwise have been. Ventilation will not exempt man from all things; but, from a careful consideration, it is safe to assume that if all the ills that deficient ventilation does create were eliminated, the remainder would require but little care.

Hippocrates gave us air, water, and locality, as the three ingredients of climate. Angus Smith gave us the chemistry of climate, which analyzes the quality of the air. After many excursions and exploring expeditions in search of something better, we are gradually drifting back to our old friends' way of thinking, and we are now as convinced of the uselessness of climatic classifications as we are of those of drugs or diseases; in fact, we have found out that the many pursuits and side studies, researches and discoveries, have, through our zeal, led us somewhat astray. Sydenham, Heberden, Boerhaave, Tissot, and Rush all tended to a greater observance of nature, and tended more to treat the individual man than the individual disease; the latter they generalized more than we have done. Beale, Thompson, Fothergill, Johnson, Hutchinson, Black, and Richardson have so far advanced beyond the beaten path that medicine has trod during the last sixty years, that they recognize a great fatherhood to our ills and pains in one great standing and distinct point, this being where perfect depuration ceases and where imperfect blood depuration begins. It is this that marks, as it were, the visible line of physical differences as a mass between the nomad and the civilized man, and its cause is in a free or an imperfect ventilation. The limits of this paper will not permit a dissertation on all the remedial measures that should be instituted to relieve the evil conditions pointed out. Were it practicable to reëstablish the old Spartan tables of the Lycurgan system—with its black broth, bread, olive and fig banquets, and with it the iron money—it would at once sweep free the coming generations from the cursing evils that affect the present one in a fast increasing ratio. It would not only benefit the poor, whose blood is impoverished by too innutritious food, and who are poisoned by foul air, but it would equally benefit the rich, as the bill of fare of the Lycurgan board tended not to induce diseases due to plethora or uræmia; but it is useless to dwell on such an Utopian prospect. Chauncey Depew and Ward McAllister would put their foot down on any such proposition. Were people less touchy about the question of interference with their immediate personal rights, the opposite of the method suggested by Dr. Lindley of Los Angeles, at the last meeting of the State Medical Society—that of castrating all male criminals for the extirpation of the criminals—might be adopted, this being the removal of the ovaries of every intemperate woman; there would be one advantage over the method of Dr. Lindley, in this: there would be no chance for a mistake. As the old French detective proverb went, when they were in

search of a criminal, "Get hold of the woman, and you will soon catch the man." According to Dr. Lindley's plan, the wrong man might be operated on; but as no intemperate woman can carry a child for nine months, while she is in a state of inebriety, without affecting the child, and as in the choice of sexual selection some otherwise very good men are so terribly careless, I feel that, were it practicable, this would be the best way to extirpate the class. This, however, cannot be done. But there is something that can be done: intemperate women should not be allowed under any circumstances to suckle children. A child would run much less risk, in the first place, by being raised by hand; and, in the next place, its future welfare would not be jeopardized either physically or morally.

In this connection I cannot help mentioning the grievous injury inflicted on children who are put out to wet nurses, by the parents' furnishing beers and liquors to the nurse that she may give a more copious supply of milk. As observed by Griesinger, insanity or mental conditions are formed in their germ at very remote periods from the time that the actual disease appears,* the generally supposed real causes being only the precipitating or determining causes. Failure in being able to provide is generally in a popular or legal sense limited to the question of a sufficiency of food and clothing to keep body and soul together. The State should recognize this failure in a broader sense. The father of a family may be able enough through his labor to provide ample food and clothing, but too poor to provide proper air. The child may live, but so warped physically or mentally or morally that it were better dead. Food and clothing are not the only necessities by any means. They may be like the last meal of a condemned man—sufficient to give him strength to mount the scaffold. The State should recognize fully the effects of foul air on the children, and make it a necessity that they should have fresh air. To this end it should assume the charge of these children. The Spartans, as well as the Indians of Southern California, took charge of *all* the children, thereby assuring the community that they should suffer neither through want nor self-indulgence, to the evident benefit of their physical and moral welfare. Our civilized communities should certainly have charge of the children of those unable or unfit to care or provide for them. We do not treat the domestic animals so thoughtlessly. A horseman would be shocked to see a thoroughbred colt in a foul and unventilated barn, or feeding on deteriorating food. His instincts for the welfare of his loved animal would even probably induce him to pay double his price, if required, to save a noble creature from losing that physique, intelligence, courage, and endurance that belong to him, and to keep him from degrading into an old hack or common horse, just as philanthropists of old devoted all their earnings and fortune to the purchase of Christian captives from the Algerine corsairs. The same spirit cannot all be dead. Our philanthropists and statesmen should fully and thoroughly comprehend the dangers and situation of these children, who, in the long run, will otherwise only grow up to be the *chair a canon* for our charitable or penal institutions later on. In taking charge of these children, it should be the aim of the State, not only, as unfortunately it is done now in unavoidable cases, to provide a charity home or mere resting place, but it should use its endeavors toward their physical, mental, and

*Griesinger, Ment. Path. Wood's Med. Lib., 1882.

moral education, as it does to its soldiers, from whom it expects future service. They should not be treated or made to feel as paupers, but as children only receiving their dues and from whom the State expects future recompense, just as the future horse in time will repay his keeper and trainer for all his kindness and care, as depicted in the winning horses of Ben Hur in the chariot race, where former kindness, good treatment, and training show good results. All this is not as Utopian as it is barbarous, cruel, and unchristian to neglect it. Where a gentle, weak woman could have guided the child aright under proper hygienic surroundings, we, in after life, turn the world upside down with swarms of detectives, at a tremendous expense, to hunt down the same being who, through unhygienic surroundings, has been converted into a vicious, determined criminal, that the majesty of the law may be vindicated.

We might better begin early, and, by surrounding the little helpless human being whom a cruel destiny has intrusted to keeping that is not of its own choosing, with better hygiene, better precept, and better example, vindicate the majesty of our enlightenment, civilization, manliness, and Christianity. These poor children never know either childish innocence or childish joys; for them there are not in after life those memories of childhood to soften and make them better, for they have had no childhood; they have prematurely aged in every sense, and the struggle for life, in all its bitterness, has been pressed like a full cup to their helpless little lips when scarce out of infancy. No wonder that the low quarters of our great cities swarm with multitudes of prostitutes scarce out of childhood, and that a brutal stupefaction has in them overcome all moral sense—a moral sense that might be said to be stifled at birth, for it requires a pure and uncontaminated atmosphere for this to thrive—something which the poor child has never enjoyed.

As observed in relation to the interpolation of various branches of science in their effect in obscuring from our view many of the simple truths of medicine, and the suggestion that we retrace our steps to spots where we know a sound foundation exists, so we may well remark to our kindred profession, they of the cloth, that if they were to have less theology and more practical, Christian common-sense, it would be better for the ends that they profess to wish to reach. It is not beyond their province, as the Mosaic law is full of examples. If the great Master was not above realizing that the welfare of his chosen people greatly depended on their physical condition, his followers should not consider it beneath them to follow his example; if the Mosaic teachings could notice even such trifles as the need of the proper aeration of the excreta of the multitude crossing the desert by the aid of the dry, powdered earth, our present shepherds should not be slow in recognizing the same facts, but how much more urgent by reason of our greater density and stability of population. The pulpit, like medicine, is losing much of its usefulness in rhetorical flourishes and figures of speech. When the great Master was asked the road to salvation, he pointed neither to shelves of theological lore nor to a collection of tracts on the ethics and ceremonials of religion: his answer was of few words.

The road to health is equally as simple. Hufeland pointed it out in what might be boiled down to a very few words: Breathe pure air; an equable climate; don't worry; and don't eat or drink more than you need. Conditions in the air that favored free ventilation were the pre-

requisites with Hufeland, Sydenham, Rush, and those of that class who may be said to be canonized and sanctified in the heart of our profession.

The space of this paper will not permit a discussion of the mechanical means. The literature on the subject is ample. Billings, Leeds, Eassie, and the hygienic works of Buck and Parker, are about complete on the subject. The enlarged edition of the lecture delivered by Leeds in Philadelphia is a short treatise devoted to the elucidation of one system of ventilation.

Some six years ago, while preparing a lecture on ventilation which was to be delivered before a meeting of the Teachers' Institute at San Diego, I prepared a small wood and tin framed house, with tin chimneys and glass sides and roof, which I used during the lecture. This was done on the Leeds system, with the aid of small lamps for fires and different lengths of lighted tapers to represent persons—manufacturing different atmospheres that were introduced into the house. This gave me such a good opinion of the system, that I afterwards incorporated it in a residence I built, and have every reason to be well pleased with it.

Before closing, it would be well to suggest that ventilation is not by any means always health, or even life. An intelligent supervision and understanding are here absolutely necessary. The four Judges and thirty-six persons who died of putrid fever contracted at the Old Bailey, were those who sat in the best ventilated part of the room, *but right in the track of the foul air as it was making its exit from the room*. Here ventilation, by its unintelligent observance, made deaths. These are the cases already mentioned as quoted from Sir John Pringle by Guy. Hartley quotes an apartment in a London house which was all right unless a fire was lit in the fireplace, which then ventilated the room. On investigation, it was found that the suction caused the filtering of air through a side wall, and that in contact with this wall there was an old dust bin, which accounted for the bad odors in the room as soon as the fire caused a current up the chimney.* So that evidently great care must be exercised over the source of the ventilation.

Aside from the above, it must not be overlooked that a whole locality, or even a city, may at times be so imperfectly ventilated as to be dangerous to life. Considering the extent of the broad canopy of the heavens and the miles of extent of atmospheric air, this may sound hypothetical and impossible, but it has nevertheless occurred.

In the second week of December, 1873, the city of London was visited by one of the densest fogs it had ever experienced. The free escape of the smoke and the proper diffusion of gases were so materially interfered with, that all the emanations from the thousands of smokestacks, chimneys, and its millions of lungs and all other sources of effluvia, were necessarily prevented from being dissipated, and were retained either in the houses or on respiratory levels.

The result of this condition is well seen in the Registrar-General's report, which shows that this state of the metropolitan atmosphere was not only the means of causing an enormous death-rate, but was also the means of producing a large number of premature labors as well, for the returns gave, for the week ending December 20th, one hundred and eight more births than the average number, and seven hundred and eighty more deaths than there had been for any one week in the previous ten years, after making all due allowance for the increase of population.

* Hartley. Air in its Relations to Life.

That it was the atmospheric condition that induced these morbid changes may well be believed, from the fact that from the London "Times" of the 11th and 12th of that month (the fog occurred on the 9th and 10th) we have an account of the doings of the "Smithfield Club Cattle Show," then in operation. We there learn that the show was interfered with by the sickness and mortality among the animals, many of whom were only saved by being hurriedly sent out into the uncontaminated air of the country. What foul air will do can well be surmised when the Registrar-General's report shows that the mortality of the week above mentioned far exceeded the mortality of the cholera week in the fall of 1866.

A proper realization of the fact that man was not built so that he should respire about twenty times per minute for amusement or luxury is evidently the last thing that strikes the laity. How far in different directions this total disregard of what nature has intended has affected us injuriously is not appreciated, any more than does our profession realize the harm that results from our attributing therapeutic effects to agents here or there, when the results are purely to be attained by a strict attention to the condition of the first and main element of the Hippocratic trilogy—air. This is well exemplified on the Italian Riviera, where the north German or Russian comes for *the climate alone*, but is so utterly indifferent to the quality of the air that he breathes, that, by the means of the box stove of the fatherland and the liberal use of caulking material industriously inserted wherever a crevice might allow the ingress of a little fresh air, he converts as nearly as possible the condition of the air of his apartment to that of the air he left behind near the far northern Baltic shores.*

With a proper appreciation of the many propositions set forth in this paper, we would have far less to contend with against quackery, as, by a better realization of the causes of disease, the laity would be lifted out of the narrow and contracted limits they now occupy in their belief in the wonderful efficacy of this or that drug, or in their insane worship of the many "isms" that disgrace the field of medicine, and which have nothing but the ignorance of the otherwise better informed laity for a stable foundation. The subject is one of the deepest interest to all, but one that the patriot, the philanthropist, and the statesman cannot neglect, for it has been said that the race which has the strongest vitality and the longest resistance to decay and death must in the end become dominant.†

The day may not be far distant when the State may need that its citizens shall all have healthy physiques. Without being unnecessarily alarmists, we cannot wholly shut our eyes to the fact that to the west there exist a horde of semi-barbarians, numerically infinitely superior to our nation, who live in a far less productive country, and who are lately making rapid progress in all that is advantageous in European civilization, and who are also fast adopting all the recent advances in the art and systems of warfare. Like to the ancient Briton, we have called these *outré-mer* barbarians to our shores, and have made them acquainted with the greater fertility of our fields, our more genial climate and richer mineral resources, and our more desirable food supplies. We have been obliged to resort to law enactments and diplomacy already; to curb

* Bennet. Pulmonary Consumption.

† Richardson. Diseases of Modern Life.

the migratory impetus that all this knowledge has caused. Diplomatic fencing generally precedes that of the sword: it may be a long or a short interval, but the latter extreme is reached sooner or later. England has Australia, South Africa, and her immense Canadian possessions as a resort for her superfluous population; Germany, France, and Italy have not so great an excess beyond their power to support but that it imperceptibly filters into the United States, to become incorporated as part of our population; but China does not amalgamate, nor has she a locality for her overflow. So that not only as philanthropists and as Christians do we owe something in the shape of fostering care to our poorer brother, but as statesmen we must realize that the poorer brother is really the strength and supporter of the nation, and that in time of need he is its real protector.

As a remedy to all of the above possible evils, which are not alone probable, but are even now actual, daily occurrences, I would suggest a little more attention to matters of practical importance when a house is being constructed. If one tenth of the attention that is paid to the proper *outer* appearance, as to the disposition of gables, windows, gim-cracks, and gingerbread work, or to the devising of bewildering and blinding fantastically colored windows, were given to placing the house in a proper sanitary condition as regards ventilation, mankind, society, and the State would all be the gainers. As it is, however, most persons, knowing very little about ventilation or its benefits, or of the risks they and theirs run through unventilation, but little attention is paid to it, and necessarily and naturally no importance whatever is paid to the matter.

Many people foolishly imagine that, because they open their rooms to the air for a few hours daily—when the winds, dust, rain, or outside temperature does not interfere with their doing so—that they have complied with all the requirements demanded by health or by the body. The proper time to ventilate is when you are at home, and especially when the process of reparation are most active—this is when you are asleep. Then, again, the laity, by an erroneous conclusion they have somehow arrived at, have formed and cultivated the habit of carefully and hermetically housing the very classes that need all the benefits of ventilation the most—these being the young and very aged. The latter, especially, should be in well-ventilated apartments, especially if any young children are with them.

Very few of our school houses are built or constructed with any view to ventilation, except *outside of school hours*. During the time that the children are in school, ventilation has to take "pot-luck" chances on an occasional opening door. I have, at times, entered the room in school houses that have cost as much as \$35,000, *half an hour* after the departure of the children, and although the windows were opened *after* school, the offensive odor peculiar to animal effluvia was still very disagreeably present. And yet the School Boards of the city thought that they had well done their duty by the children and the citizens. The children with headaches and other derangements arising from poor ventilation that I have individually treated, show but too well the effects of a foul air. The architect did make a *pretense* at ventilation, but that was all that was really accomplished.

All public buildings, of whatsoever sort or for whatsoever purpose, should only be constructed under strict inspection, and after the approval of the plans by a Board of competent sanitarians, composed of men

skilled in sanitary construction and engineering. The slipshod way in which these affairs are now managed is unworthy of the nineteenth century, and of a nation that should set a better example. The schools above mentioned are but nurture beds for neurotics, and are as deficient, so far as their sanitary condition is concerned, as any building can be that is only ventilated when it is unoccupied. A building which is only ventilated at those times, can in no sense be termed even passably perfect in any hygienic sense.

One great drawback to properly ventilating buildings I find to consist in the fact that they are constructed with an utter disregard to the requirements of climate, either in the material used, exposure of building, and the attempt to mix up the means of lighting with those of ventilation—something which should be entirely separate. This utter disregard of climatic conditions cannot always be made with impunity, and I have seen various and ineffectual attempts to introduce some very primitive and impractical system of ventilation into public buildings some years *after* they had been in use; one of these being a Masonic hall and the other a court house. Had these been school houses, the utter want of ventilation would not have been noticed, as teachers are supposed to be in a normal condition if with headache and a backache, under any and all circumstances, and children very seldom complain; but in the event of any sickness, epidemic, or the critical period of existence in a girl's life, the want of ventilation, from which the system has suffered, is then very plainly discernible.

I would make it as a suggestion that no building for public use, be it church, theater, hall, school, or hospital, nor administrative buildings for State, county, or municipality, be constructed or allowed to be constructed until its plans are submitted to and approved by a competent Board of sanitarians. I would even go further—as it is a well-recognized principle that cities require “lungs,” or parks, and commons, not in the suburbs, or outskirts, but in their most populous places—that no one should be allowed to plat out a town, designed for the congregation of a population, without said plat being also submitted to a like competent sanitary Board for examination and approval—as the relation of the lay of the streets to compass points and the prevailing winds, and the proper laying out of alleys, and parks, width of streets, as demanded by the latitude, and regulation as to height of buildings, and all matters that affect the health and length of life of its future dwellers. It seems as if it were the height of absurdity for a city to have to contend with the work of marplots and botches for centuries to come, when it should not have been allowed to start wrong in the first instance. The simple fact that we are a republic, is no reason for such irrational and primitive methods. Old European cities and towns are now at great expense undergoing the haphazard and marplot work of the middle ages, and it would seem as if we might at least profit by their example, and not perpetuate tenth or sixteenth century blunders, which, I am very sorry to have to remark, is precisely what we are doing.

The State, county, and municipality must first set a hygienic example on these matters, and the supervision must further be carried into the construction of all public buildings. From these starting points the good work will reach the villa and the cottage, and we will then be better morally as well as physically. These are matters that should occupy the minds of our statesmen. It will lessen the needs and expense of penitentiaries, reformatories, jails, asylums, and hospitals.

SANITARY LAWS OF THE STATE OF CALIFORNIA.

POLITICAL CODE.

PART III—Of the Government of the State.

TITLE VII—General Police of the State.

CHAPTER I.

IMMIGRATION.

- SECTION 2952. Lepers, lazarettos for.
2955. Examination and disposition of lepers. Fees.
2959. Fines and penalties, lien on vessel.
2960. Other commutations.
2962. Certain vessels exempted.
2966. Ex officio Commissioners.
2968. Bond of Commissioner.

SEC. 2952. It shall not be lawful for lepers, or persons affected with leprosy or elephantiasis, to live in ordinary intercourse with the population of this State; but all such persons shall be compelled to inhabit such lazarettos or lepers' quarters as may be assigned to them by the Board of Supervisors of the city or county in which they shall be domiciled or settled; and the Board of Supervisors are vested with power and are required to make all necessary provisions for the separation, detention, and care of lepers, or persons affected with leprosy or elephantiasis, settled or domiciled in their respective cities or counties. The Superintendent or manager of all lepers' quarters under this chapter shall forward quarterly statements, showing the name, age, sex, and birthplace of each leper in such quarter, to the Secretary of State, who shall keep a proper record of such matters for the information of the public. [In effect March 25, 1876.]

SEC. 2955. The Commissioner of Immigration must satisfy himself whether or not any person who shall arrive in this State by vessel from any foreign port or place is a leper, or affected with the disease known as leprosy or elephantiasis, before such person shall mingle with the population of this State. For the purpose of ascertaining said fact the Commissioner is vested with the power and authority to detain such persons on board any such vessel so arriving, and to assign the vessel to a berth or anchorage separate and apart from other vessels, and at a safe and suitable distance from the shore, if in his judgment it shall be necessary, until such fact can be fully ascertained by him. Such fact shall be ascertained by personal inspection and examination of each and every person on board such vessel; and the Commissioner of Immigration is authorized, empowered, and required to make such personal inspection and examination of all persons so arriving by any such vessel, the same to be made at such berth or anchorage as he shall, in his

discretion, assign to such vessel for that purpose, and shall be made before the landing of any person thereupon. All of such persons who, upon inspection and examination, are found to be lepers, or affected with the disease known as leprosy or elephantiasis, shall be taken in charge by the Commissioner of Immigration, and placed in a suitable lazaretto, or lepers' quarters, to be provided or designated by the Board of Supervisors, whenever necessary for that purpose, as hereinbefore prescribed, and there detained and properly cared for, separate and apart from the general population of this State, so long as they, the said lepers, shall elect to remain in the State of California, or until they shall have recovered from said disease, and no longer. All of such persons as shall be found to be free from said disease shall be allowed to depart and go at their will, without unnecessary detention or delay, and shall be entitled to receive a certificate of the fact of their freedom from said disease from said Commissioner. For his services in making such examination and inspection the Commissioner of Immigration shall demand and collect from the master, owner, or consignee of such vessel the sum of seventy cents, in United States gold or silver coin, for each and every person so examined or inspected, which sum, except four thousand dollars a year and expenses of office, shall, when required for such purpose, be paid by the Commissioner into the State Treasury, to be used in the maintenance, when necessary, of such lazarettos or lepers' quarters as shall be constructed under this law. Any master, owner, or consignee of any vessel arriving at any port of this State who shall fail or refuse to perform, or permit the performance of, any of the acts or things required by this chapter, or to take and occupy with his vessel the berth or anchorage assigned for the same by the Commissioner, pending the examination and inspection herein provided for, or who shall permit or allow any person arriving in such vessel to depart therefrom, and to communicate, mingle, or associate with the population of this State, or any part thereof, until after such examination and inspection by the Commissioner is had, shall, for every such act or omission, forfeit to the Commissioner of Immigration the sum of one thousand dollars in United States gold coin, to be sued for and recovered by suit in any Court of competent jurisdiction, and to be applied in like manner with the fees. And any master, owner, or consignee of any such vessel so arriving, who shall refuse or neglect to pay, or cause to be paid to said Commissioner, the fee of seventy cents for the examination and inspection of each and every person so arriving in such vessel, shall forfeit to said Commissioner, for each case, the sum of five hundred dollars in United States gold coin, to be recovered and applied as above. And the Commissioner shall have a lien upon the vessel, and the same shall be sold to pay any judgment recovered under this Act. The Commissioner shall have the power to call in the aid of the Sheriff and all police authorities to assist in enforcing this law. And he may appoint one or more deputies under him, who shall be vested with all the powers of the Commissioner, and may discharge his official duties when required by him. The Commissioner of Immigration must prepare and transmit to the Secretary of State quarterly statements, certified under his hand and seal, showing the name, age, sex, birthplace, and present residence of every leper, or person affected with leprosy or elephantiasis, examined or inspected by him, as well as any other infor-

mation or fact touching the character and prevalence of said disease within his knowledge. [In effect March 25, 1876.]

SEC. 2959. For all fines and penalties imposed by this chapter upon any master or commander, owner or consignee, for any omission, neglect, or refusal to perform any act or duty required by this chapter, such vessel is liable; and the amount of such fines or penalties are a lien upon such vessel, and have priority over all other liens, except those for seamen's wages, bottomry bonds, and respondentia. Such penalties and fines may be sued for and recovered in a civil action, with costs of suit, by the Commissioner, or by his authorized attorney, in the name of the people of the State of California, in any Court having cognizance thereof, and when recovered must, after deducting the expenses, be paid into the State Treasury.

SEC. 2960. The Commissioner may compound or commute, for any of the penalties or fines, upon such terms as he thinks proper, and at the end of every month report to the Controller of State the reasons and causes of such compounding or commutation. * * *

SEC. 2962. Masters of vessels arriving at any of the ports of this State from any port in this State, or from Oregon or Washington Territory, are exempt from making the statement required by this chapter, when the vessels in which they arrive have not taken on board* at their port of departure, or at any intermediate port, any alien passenger, to be landed at the port of arrival; and masters of vessels arriving from Panama are also exempted from the provisions of this chapter, when they have not landed, or are not about to land, passengers who took their departure from ports other than the port of New York; and in no case must such master be required to report any passenger other than way passengers taken on board between the port of New York and the port of arrival in this State.

SEC. 2963. The Consuls, Ministers, agents, or other public functionaries of any foreign Government, arriving in this State in their official capacity, are exempt from the provisions of this chapter.

SEC. 2964. The Commissioner of Immigration must approve all bonds and administer all oaths required in the discharge of his duties. Whenever it appears that the master or commander of any vessel has not made a full and correct report, as provided by this chapter, the Commissioner must inquire into the same, and for that purpose may require the attendance of witnesses before him in the same manner as Notaries Public may in civil cases. Testimony so taken may be read as evidence on the trial of any action commenced for any penalty or forfeiture accruing under the provisions of this chapter in the same manner, and with like effect, as if regularly taken in such action.

SEC. 2966. In all the ports in this State, other than San Francisco, the Mayor or chief municipal officer at such port, or if there be none such, then the Sheriff of that county, is ex officio Commissioner of Immigration for such port, and in carrying out the provisions of this chapter, and has all the powers and is liable to all the penalties provided herein.

SEC. 2968. The Commissioner of Immigration for the port of San Francisco must execute an official bond in the sum of twenty-five hundred dollars. [In effect March 25, 1876.]

CHAPTER II.

PRESERVATION OF PUBLIC HEALTH.

ARTICLE I. STATE BOARD OF HEALTH.

- II. VACCINE AGENT.
- III. HEALTH AND QUARANTINE REGULATIONS FOR THE CITY AND HARBOR OF SAN FRANCISCO.
- IV. HEALTH REGULATIONS FOR THE CITY OF SACRAMENTO.
- V. HEALTH AND QUARANTINE OF OTHER CITIES, TOWNS, AND HARBORS.

ARTICLE I.

STATE BOARD OF HEALTH.

- SECTION 2978. Who constitute the State Board.
- 2979. Duties of.
- 2980. To report as to the effect of intoxicating liquors.
- 2981. Meetings, and election of officers.
- 2982. Duties of Secretary. Salary of Secretary.
- 2983. Expenses of, limited.

SEC. 2978. The State Board of Health consists of seven physicians—two of the city of Sacramento, and five from other portions of the State—~~appointed by the Governor~~ for the term of four years.

SEC. 2979. The State Board of Health must place themselves in communication with the local Boards of Health, hospitals, asylums, and public institutions throughout the State, and take cognizance of the interests of health and life among the citizens generally. They must make sanitary investigations and inquiries respecting the causes of disease, especially of epidemics, the source of mortality, and the effects of localities, employments, conditions, and circumstances on the public health, and gather such information in respect to these matters as they may deem proper for diffusion among the people. They may devise some scheme whereby medical and vital statistics of sanitary value can be obtained, and act as an advisory Board to the State in all hygienic and medical matters, especially such as relate to the location, construction, sewerage, and administration of prisons, hospitals, asylums, and other public institutions. They must, at each biennial session of the Legislature, make a report, with such suggestions as to legislative action as they deem proper.

SEC. 2980. The Board must examine into and report what, in their best judgment, is the effect of the use of intoxicating liquor as a beverage upon the industry, prosperity, happiness, health, and lives of the citizens of the State; also, what legislation, if any, is necessary in the premises.

SEC. 2981. The Board must meet at the capital of the State, at least once in every three months. They must elect from their own number a President and a Permanent Secretary; the latter must reside at the capital, and is their executive officer. No member, except the Secretary, receives any compensation; but the actual traveling expenses of the members, while engaged in the duties of the Board, are allowed, and paid out of the General Fund.

SEC. 2982. The Secretary must superintend the work and perform such other duties as the Board may require. He must furnish the Legislature, when in session, such information cognate to this chapter as, from time to time, may be necessary. An annual salary of twenty-five hundred dollars, and his office and other necessary expenses in-

curred in the performance of his duties, must be paid to him in the same manner as salaries of State officers are paid.

SEC. 2983. The expenses of the Board, including the salary of the Secretary, must not exceed four thousand dollars per annum.

ARTICLE II.

VACCINE AGENT.

- SECTION 2993. Agent to obtain genuine vaccine matter.
2994. Compensation and duty of.

SEC. 2993. The Vaccine Agent must obtain a supply of the genuine vaccine matter, and preserve the same for the use and benefit of the citizens of the State. [Basis of article: Stats. 1852, p. 138.]

SEC. 2994. Such agent must furnish genuine vaccine matter, approved by the State Board of Health, to any regular practicing physician in good standing in his profession in this State. He may charge and receive for every parcel of vaccine matter furnished, the sum of five dollars, which is full compensation for his services and expenses.

ARTICLE III.

HEALTH AND QUARANTINE REGULATIONS FOR THE CITY AND HARBOR OF SAN FRANCISCO.

- SECTION 3004. Quarantine grounds, location of.
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3006. Mayor ex officio President. Time of meeting.
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3032. Actions, in whose name maintained.
3033. Vacation of infected and dangerous houses.
3034. Physicians to report infectious diseases.
3035. Board of Health to have charge of cemetery.

SEC. 3004. The quarantine grounds of the bay and harbor of San Francisco are at the anchorage of Sausalito.

SEC. 3005. The Board of Health of the City and County of San Francisco consists of the Mayor of the city and county and four physicians in good standing, residing in the City and County of San Francisco, appointed by the Governor, and holding their offices for the term of five years.

SEC. 3006. The Mayor is ex officio President of the Board. The

Board must meet monthly, and at such other times as the President may direct. In the absence of the President, the Board may elect a Chairman, who is clothed with the same powers as the President.

SEC. 3007. The Health Officer for the City and County and Port of San Francisco is elected by the Board of Health, and holds office at its pleasure. He must be a graduate of some medical college, in good standing, and must reside within the city limits of San Francisco.

SEC. 3008. The Health Officer is the executive officer of the Health Department, and he may, in his discretion, cause the removal to a hospital of any and all persons within the limits of the City and County of San Francisco, infected with variola. [In effect March 9, 1878.]

SEC. 3009. The Board of Health must appoint a Quarantine Officer, who shall be a physician in good standing; a Secretary, one Assistant Secretary, six Health Inspectors, one Market Inspector, and one Messenger, whose duties must be fixed by the Board of Health. They must also appoint one Superintendent Physician, one Resident Physician, one Steward, one Matron, one Apothecary, two Visiting Physicians, two Visiting Surgeons, as officers of the City and County Hospital, in and for the City and County of San Francisco; one each of said Visiting Physicians and Surgeons to be nominated by the Faculty of the Medical Department of the University of California, and one each of said Visiting Physicians and Surgeons to be nominated by the Medical College of the Pacific. Said Board may also appoint one Engineer for the City and County Hospital. They may also appoint one Superintendent, one Resident Physician, one Matron, and such other employés as are now authorized by law, to be employed in and for the Almshouse of said city and county. They shall also have power to appoint and prescribe the duties of one City Physician and one Assistant City Physician, who shall be designated as Police Surgeons, and whose duty it shall be to make all autopsies required of them by the Coroner of said city and county. And said Board is also empowered to appoint such employés and such medical attendants as they may deem necessary in the Health Department, and in all the various institutions which are by law placed under their supervision; and the compensation of such employés and medical attendants shall be fixed by the Board of Health. The appointing power aforesaid is vested solely in said Board of Health, and said Board shall have power to prescribe the duties of said appointees, and shall not remove the same without just cause. The heads of departments appointed by the Board of Health, to wit: the Health Officer, Resident Physician of City and County Hospital, and Superintendent of Almshouse, shall not be removed except by a concurrence of four members of said Board of Health.

SEC. 3010. The following annual salaries are hereby allowed to the officers of the Health Department, and such other officers and employés as are mentioned in the preceding section, viz.: Health Officer, three thousand dollars; Quarantine Officer, eighteen hundred dollars; Secretary, two thousand one hundred dollars; Assistant Secretary, one thousand two hundred dollars; Health Inspectors, one thousand two hundred dollars each; Market Inspector, one thousand two hundred dollars; Messenger, nine hundred dollars; City Physician, one thousand eight hundred dollars; Assistant City Physician, one thousand two hundred dollars; all of said salaries, together with the salaries of such other employés of the Health Department as may be appointed by the Board

of Health, must be paid in equal monthly installments out of the General Fund of the City and County of San Francisco, in the same manner as the salaries of the other officers of said city and county are paid. There shall be paid to the officers and employes of the City and County Hospital and Almshouse, the following annual salaries, viz.: Superintendent Physician, two thousand four hundred dollars; Resident Physician, one thousand five hundred dollars; Steward, one thousand five hundred dollars; Matron, seven hundred and twenty dollars; one Apothecary, one thousand two hundred dollars; Visiting Physicians and Surgeons, one thousand two hundred dollars each; Engineer, one thousand two hundred dollars; Superintendent of Almshouse, two thousand four hundred dollars; Matron of Almshouse, seven hundred and twenty dollars; and all other medical attendants and employes of said institutions are to be paid such sums as may be authorized by law, and as provided in the preceding section; all to be paid in equal monthly installments, out of the Hospital and Almshouse Fund of said City and County of San Francisco; and the Auditor of said city and county is hereby directed to audit the said demands, payable out of the funds aforesaid, upon the approval of the same by the said Board of Health, and also to audit all demands for salaries of medical attendants and employes appointed by the Board of Health in accordance with this chapter, for the amounts authorized to be paid, when the same shall have been approved by said Board; and the Treasurer of said city and county must pay said demands out of said funds. The Clerk of the Mayor of the City and County of San Francisco shall not receive any compensation as Clerk of the Board of Health. [In effect March 9, 1878.]

SEC. 3011. The Health Officer, in addition to his salary, receives such sums for the necessary expenses of his office as the Board of Health may direct, and the Auditor must audit and the Treasurer pay such sums out of the General Fund. The Board of Supervisors must provide proper offices for the Health Department.

SEC. 3012. The Board of Health have general supervision of all matters appertaining to the sanitary condition of the city and county, including the City and County Hospital, the County Jail, Almshouse, Industrial School, and all public health institutions provided by the City and County of San Francisco; and may adopt such orders and regulations, and appoint or discharge such medical attendants and employes as to them seems best to promote the public welfare; and may appoint as many Health Inspectors as they deem necessary in time of epidemics.

SEC. 3013. Shipmasters bringing vessels into the harbor of San Francisco, and masters, owners, or consignees having vessels in the harbor which have on board any cases of Asiatic cholera, smallpox, yellow, typhus, or ship fever, must report the same, in writing, to the Quarantine Officer before landing any passengers, casting anchor, or coming to any wharf, or as soon thereafter as they, or either of them, become aware of the existence of either of the diseases on board of their vessels. [In effect March 9, 1878.]

SEC. 3014. No Captain or other officer in command of any vessel sailing under a register arriving at the port of San Francisco, nor any owner, consignee, agent, or other person, having charge of such vessel, must, under a penalty of not less than one hundred dollars, nor more

than one thousand dollars, land, or permit to be landed, any freight, passengers, or other persons from such vessel until he has reported to the Quarantine Officer, presented his bill of health, and received a permit from that officer to land freight, passengers, or other persons. [In effect March 9, 1878.]

SEC. 3015. Every pilot who conducts into the port of San Francisco any vessel subject to quarantine, or examination by the Quarantine Officer, must—

First—Bring the vessel no nearer the city than is allowed by law;

Second—Prevent any person from leaving and any communication being made with the vessel under his charge until the Quarantine Officer has boarded her and given the necessary orders and directions;

Third—Be vigilant in preventing any violation of the quarantine laws, and report without delay all such violations that come to his knowledge to the Quarantine Officer;

Fourth—Present the master of the vessel with a printed copy of the quarantine laws, unless he has one;

Fifth—If the vessel is subject to quarantine, by reason of infection, place at the mast-head a small yellow flag. [In effect March 9, 1878.]

SEC. 3016. Every master of a vessel subject to quarantine or visitation by the Quarantine Officer, arriving in the port of San Francisco, who refuses or neglects, either—

First—To proceed with and anchor his vessel at the place assigned for quarantine, when legally directed so to do; or,

Second—To submit his vessel, cargo, and passengers to the Quarantine Officer, and furnish all necessary information, to enable that officer to determine what quarantine or other regulations they ought, respectively, to be subject; or,

Third—To report all cases of disease and of deaths occurring on his vessel, and to comply with all the sanitary regulations of the bay and harbor—

Is liable in the sum of five hundred dollars for every such neglect or refusal. [In effect March 9, 1878.]

SEC. 3017. All vessels arriving off the port of San Francisco from ports which have been legally declared infected ports, and all vessels arriving from ports where there is prevailing, at the time of their departure, any contagious, infectious, or pestilential diseases, or vessels with decaying cargoes, or which have unusually foul or offensive holds, are subject to quarantine, and must be, by the master, owner, pilot, or consignee, reported to the Quarantine Officer without delay. No such vessel must cross a right line drawn from Meiggs Wharf to Alcatraz Island until the Quarantine Officer has boarded her and given the order required by law. [In effect March 9, 1878.]

SEC. 3018. The Quarantine Officer must board every vessel subject to quarantine or visitation by him, immediately on her arrival, make such examination and inspection of vessel, books, papers, or cargo, or of persons on board, under oath, as he may judge expedient, and determine whether the vessel should be ordered to quarantine; and, if so, the period of quarantine. [In effect March 9, 1878.]

SEC. 3019. No Captain or other officer in command of any passenger-carrying vessel of more than one hundred and fifty tons burden, nor of any vessel of more than one hundred and fifty tons burden having passengers on board, nor any owner, consignee, or other person having

charge of such vessel or vessels, must, under a penalty of not less than one hundred dollars, nor more than one thousand dollars, land or permit to be landed any passenger from the vessel, until he has presented his bill of health to the Quarantine Officer, and received a permit from that officer to land such passengers, except in such cases as the Quarantine Officer deems it safe to give the permit before seeing the bill of health. [In effect March 9, 1878.]

SEC. 3020. The following fees may be collected by the Quarantine Officer: For giving a permit to land freight or passengers, or both, from any sailing vessel of less than five hundred tons burden from any port out of this State, two dollars and fifty cents; over five hundred and under one thousand tons burden, five dollars; each additional one thousand tons burden, or fraction thereof, an additional two dollars and fifty cents. For steam vessels propelled in whole or in part by steam, of one thousand tons burden or less, five dollars, and two dollars and fifty cents for each additional one thousand tons burden, or fraction thereof; but vessels not propelled in whole or in part by steam, sailing to and from any port or ports of the Pacific States of the United States or Territories, and whaling vessels entering the harbor of San Francisco, are excepted from the provisions of this section. [In effect March 9, 1878.]

SEC. 3021. The Board of Health may enforce compulsory vaccination on passengers in infected ships, or coming from infected ports.

SEC. 3022. The Board of Health may provide suitable hospitals, to be situated at or near Sausalito, and furnish and supply the same with nurses and attachés, and remove thereto all persons afflicted with cholera, smallpox, yellow, typhus, or ship fever.

SEC. 3023. The Health Officer must keep a record of all births, deaths, and interments occurring in the City and County of San Francisco. Such records, when filled, must be deposited in the office of the County Recorder, and produced when required for public inspection.

SEC. 3024. Physicians and midwives must, on or before the fourth day of each month, make a return to the Health Officer of all births, deaths, and the number of still-born children occurring in their practice during the preceding month. In the absence of such attendants, the parent must make such report within thirty days after the birth of the child. Such returns must be made in accordance with rules adopted, and upon blanks furnished by the Board of Health. [In effect March 9, 1878.]

SEC. 3025. No person shall deposit in any cemetery, or inter in the City and County of San Francisco, any human body without first having obtained and filed with the Health Officer a certificate signed by a physician or midwife, or a Coroner, setting forth, as near as possible, the name, age, color, sex, place of birth, occupation, date, locality, and cause of death of the deceased, and obtain from such Health Officer a permit; nor shall any human body be removed or disinterred without the permit of the Health Officer, or by order of the Coroner. Physicians, when deaths occur in their practice, must give the certificate herein mentioned. Hereafter it shall be the duty of the Assistant City Physician or Police Surgeons to perform all autopsies which may be required in the Coroner's office of the City and County of San Francisco, all such autopsies being made without charge to the city. It shall be the duty of the Health Officer to see that the dead body of a human being is not allowed to remain in any public receiving vault for a longer

period than five days. At the expiration of that time he shall cause the body to be placed in a vault or niche constructed of brick, stone, or iron, and hermetically sealed. It shall also be his duty to require all persons having in charge the digging of graves and burial of the dead, to see that the body of no human being who had reached ten years of age shall be interred in a grave less than six feet deep, or if under the age of ten years, the grave to be not less than five feet deep. [In effect March 9, 1878.]

SEC. 3026. Superintendents of cemeteries within the boundaries of the City and County of San Francisco must return to the Health Officer, on each Monday, the names of all persons interred or deposited within their respective cemeteries for the preceding week. [In effect March 9, 1878.]

SEC. 3027. No Superintendent of a cemetery can remove or cause to be removed, disinter or cause to be disinterred, any corpse that has been deposited in the cemetery, without a permit from the Health Officer, or by order of the Coroner.

SEC. 3028. Whenever a nuisance shall exist on the property of any non-resident, or any property, the owner or owners of which cannot be found by the Health Inspector after diligent search, or on the property of any owner or owners upon whom due notice may have been served, and who shall for three days refuse or neglect to abate the same, or on any city property, it shall be the duty of the Board of Health to cause the said nuisance to be at once removed or abated, and to draw upon the General Fund for such sums as may be required for its removal or abatement, not to exceed two hundred dollars; *provided*, that whenever a larger expenditure is found necessary to be made for the removal or suppression of any nuisance, the Board of Supervisors of said city and county shall, upon the written application of the Board of Health, by ordinance, appropriate, allow, and order paid out of the General Fund, such sum or sums as may be necessary for that purpose; and the Auditor shall audit, and the Treasurer shall pay, all appropriations of money made in pursuance of this section, in the same manner as is now provided by law for auditing and paying demands upon the treasury; said sum or sums so paid shall become a line on the property from which said nuisance has been removed or abated, in pursuance of this section, and may be recovered by an action against such property. And it shall be the duty of the City and County Attorney to foreclose all such liens in the proper Court, in the name of and for the benefit of said city and county, and when the property is sold, enough of the proceeds shall be paid into the City and County Treasury to satisfy the lien and costs; and the overplus, if any there be, shall be paid to the owner of the property, if he be known, and if not, then into the Court for his use when ascertained. The Board of Health is hereby vested with power to act upon, define, determine, and adjudge what shall constitute a nuisance in said city and county, and to require the same to be abated in a summary manner. Any person who maintains, permits, or allows a nuisance to exist upon his or her property or premises after the same has been determined by said Board to be a nuisance, and after notice to remove the same has been served upon such person, is guilty of a misdemeanor, and shall be punished accordingly; and each day of such existence, after notice, shall be deemed a separate and distinct offense; and it is the duty of the Health Officer to prosecute all persons

guilty of violating this law by continuous prosecutions until the same is abated and removed. [In effect March 9, 1878.]

SEC. 3029. The Health Officer must keep in his office a book in which he must make an entry of all fees collected by him. He must pay all fees collected to the City and County Treasurer weekly, to the credit of the General Fund.

SEC. 3030. The Health Officer must execute an official bond, to be approved by the Board of Health, in the sum of ten thousand dollars.

SEC. 3031. Any member of the Board of Health, Health Officer, or Quarantine Officer, or Secretary, or Assistant Secretary of the Health Department, is empowered to administer oaths on business connected with that department. [In effect March 9, 1878.]

SEC. 3032. Whenever any cause of action arises under any of the provisions of this chapter, suit may be maintained therein in the name of the Health Officer, in any District Court of this State.

SEC. 3033. Whenever it shall be certified to the Board of Health, by the Health Officer, that any building or part thereof is unfit for human habitation, by reason of its being so infected with disease as to be likely to cause sickness among the occupants, or, by reason of its want of repair, has become dangerous to life, said Board may issue an order and cause the same to be affixed conspicuously on the building, or part thereof, and to be personally served upon the owner, agent, or lessee, if the same can be found in this State, requiring all persons therein to vacate such building, for the reasons to be stated therein as aforesaid. Such building, or part thereof, shall, within ten days thereafter, be vacated; or within such shorter time (not less than twenty-four hours), as in said notice may be specified; but said Board, if it shall become satisfied that the danger from said house, or part thereof, has ceased to exist, may revoke said order, and it shall thenceforward become inoperative. [In effect March 9, 1878.]

SEC. 3034. *First*—Every physician in the city and county shall report to the Health Officer, in writing, every patient he shall have laboring under Asiatic cholera, variola, diphtheria, or scarlatina, immediately thereafter, and report to the same officer every case of death from such disease immediately after it shall have occurred.

Second—Every householder in said city and county shall forthwith report in writing, to the Health Officer, the name of every person boarding, or inmate, at his or her house, whom he or she shall have reason to believe sick of cholera or smallpox, and any deaths occurring at his or her house from such disease. [In effect March 9, 1878.]

SEC. 3035. The Board of Health shall have entire charge of the City Cemetery, and shall employ a Superintendent, at a salary of seventy-five dollars per month, the same to be paid as the salaries of other employés are paid. [In effect March 9, 1878.]

ARTICLE IV.

HEALTH REGULATIONS FOR THE CITY OF SACRAMENTO.

- SECTION 3042. Board of Health, who and how appointed.
3043. Term of office.
3044. Powers of the Board of Health.
3045. Pesthouses, how located and conducted.
3046. Death records.
3047. Enforcement of regulations. Health Officer.
3048. Expenses, how paid.
3049. Compensation, how paid.

SEC. 3042. The Board of Trustees of the city of Sacramento may establish by ordinance a Board of Health therefor, to consist of five practicing physicians, graduates of a medical college of recognized respectability; and the President of the Board of Trustees is ex officio President of the Board.

SEC. 3043. The members of the Board hold their offices at the pleasure of the appointing power.

SEC. 3044. The Board of Health of the city of Sacramento has a general supervision of all the matters appertaining to the sanitary condition of the city, and may make such rules and regulations in relation thereto as are not inconsistent with law.

SEC. 3045. The Board of Health may locate and establish pesthouses, and cause to be removed thereto, and kept, any person having a contagious or infectious disease; may discontinue or remove the same, and make such rules and regulations regarding the conduct of the same as are needful.

SEC. 3046. The Board of Health must exercise a general supervision over the death records of the city of Sacramento, and may adopt such forms and regulations for the use and government of physicians, undertakers, and Superintendents of Cemeteries, as in their judgment may be best calculated to secure reliable statistics of the mortality in the city, and prevent the spread of disease.

SEC. 3047. The Board of Trustees of the city of Sacramento must, by ordinance or otherwise, provide for enforcing such orders and regulations as the Board of Health may from time to time adopt; and in times of epidemics, or when deemed necessary by the Board of Health, a Health Officer must be employed to enforce the laws in relation to the sanitary condition of the city.

SEC. 3048. All expenses necessarily incurred in carrying out the provisions of this article must be provided for by the Board of Trustees of the city of Sacramento, who may make appropriation therefor out of the Special Street Fund, if the same is sufficient; if not, they may by taxation provide a fund therefor.

SEC. 3049. The Board of Trustees must fix the compensation of the Board of Health and the Health Officer.

ARTICLE V.

HEALTH AND QUARANTINE OF OTHER CITIES, TOWNS, AND HARBORS.

- SECTION 3059. Boards of Supervisors may adopt Article III.
 3060. Boards of Supervisors may adopt Article IV.
 3061. Board of Health established in towns and cities.
 3062. May appoint Health Officer in lieu of Board.
 3063. Per capita or property tax, how levied.

SEC. 3059. The Board of Supervisors of any county in which there is a port of entry or harbor, for which there is not otherwise provided health and quarantine regulations, may by an ordinance adopt the whole or any part of the provisions of article three of this chapter, appoint a Board of Health, or Health Officer, locate quarantine grounds when necessary, and provide for the enforcement of health and quarantine regulations.

[Local adaptation of health and quarantine regulations, see Sec. 4046, Sub. 20.]

SEC. 3060. In like manner the Board of Supervisors of any county in which there is an unincorporated city or town, for which there is not otherwise provided a Board of Health, or health regulations in time of epidemics or the existence of contagious or infectious diseases, may by an ordinance adopt for such city or town, in whole or in part, the provisions of article four of this chapter, for some definite period of time, and appoint therefor a Board of Health.

SEC. 3061. It shall be the duty of the Board of Trustees, Council, or other corresponding Board, of every incorporated town and city of this State, to establish, by ordinance, a Board of Health for such town or city to consist of five persons, one of whom at least shall be a practicing physician and a graduate of some reputable school of medicine, and one, if practicable, a civil engineer. The members of the Board shall hold their offices at the pleasure of the appointing power. Every local Board of Health established in this State must:

First—Supervise all matters pertaining to the sanitary condition of their town or city, and make such rules and regulations relative thereto as are necessary and proper, and not contrary to law.

Second—Report to the Secretary of the State Board of Health, at Sacramento, at such times as the State Board of Health may require:

(a) The sanitary condition of their locality.

(b) The number of deaths, with the cause of each, as near as can be ascertained, within their jurisdiction, during the preceding month.

(c) The presence of epidemic or other dangerous, contagious, or infectious disease, and such other matters, within their knowledge or jurisdiction, as the State Board may require.

The Trustees, Council, or other legislative Board, by whatever name known, of any incorporated city or town of this State may, by ordinance, adopt any portion of article three and article four of this chapter, or either of them, for some definite period of time, as may seem proper for the regulation of sanitary matters within their town or city. [In effect March 19, 1878.]

[This Act shall not extend to any incorporated city or town, or city and county, for which health regulations and [are?] provided by special statutes.

[Local adaptation of health laws, see Sec. 4046, Sub. 20; Sec. 4408, Sub. 18.]

[Section inapplicable to incorporated city, town, etc., for which health regulations provided by special statute, see Sec. 2 of Amendatory Acts in Stats. 1878, p. 59.]

SEC. 3062. The Board of Supervisors of each county must appoint, in each unincorporated city or town of five hundred or more inhabit-

ants, a Health Officer, who has all the duties and powers of the Board of Health and Health Officer, as specified in this and the two preceding articles. [In effect March 1, 1889, as amended.]

SEC. 3063. All necessary expenses of enforcing this article are charges against the counties, cities, or towns, respectively, for the payment of which the county, city, or town may levy a per capita tax of not exceeding three dollars, or a property tax of not exceeding one fourth of one per cent, yearly, until the same is paid.

SEC. 3064. The Board of Supervisors must fix the salary or compensation of Boards of Health or Health Officers, and provide for the expenses of enforcing the provisions of this article. If the Board of Supervisors or Board of Trustees, Council, or other corresponding Board of any incorporated town, neglect to provide a Board of Health or Health Officer by the first day of July, eighteen hundred and eighty-nine, the State Board of Health may direct the District Attorney of the county to begin an action against such Board of Supervisors, or Board of Trustees, or corresponding Board, to compel the performance of their duty, or may appoint a Board of Health, or Health Officer with the powers of a Board of Health, for such town or city, and the expenses of such Board of Health, or Health Officer, shall be a charge against the incorporated city or town for which such appointment shall be made; and when the appointment is made for unincorporated towns the expenses of the Board of Health, or Health Officer, are a charge against the county. [In effect March 1, 1889.]

CHAPTER III.

REGISTRY OF BIRTHS, MARRIAGES, AND DEATHS.

- SECTION 3074. Registry of marriages.
 3075. Registry of births.
 3076. Registry of deaths.
 3077. Reports to Recorder.
 3078. Same.
 3079. Duties of Recorder.
 3080. Report to the Secretary of State Board of Health.
 3081. Fees.
 3082. Penalties.
 3083. Printing and distribution of forms of register.

SEC. 3074. All persons who perform the marriage ceremony must keep a registry of the time of each marriage so celebrated, the residence, the names in full, the place of birth, the age of each party, and whether either party has ever been before married. [In effect March 16, 1878.]

SEC. 3075. All physicians and professional midwives must keep a registry of the time of each birth at which they assist professionally, the sex, race, and color of the child, and the names and residence of the parents.

SEC. 3076. Physicians who attend deceased persons in their last sickness, clergymen who officiate at a funeral, Coroners who hold inquests, sextons and undertakers who bury deceased persons, must each keep a registry of the name, age, residence, and time of death of such person. [Approved March 30th; in effect July 6, 1874.]

SEC. 3077. All persons registering marriages, births, or deaths, must

quarterly file with the County Recorder a certified copy of their register. All such certificates must specify, as near as may be ascertained, the name in full, age, occupation, term of residence in the city or county, birthplace, condition, whether single or married, widow, or widower, sex, race, color, last place of residence, and cause of death of all decedents. [In effect March 16, 1878.]

SEC. 3078. If at birth no physician or midwife attend, then the parents must make the report.

SEC. 3079. The Recorder must keep separate registers, to be known as the "Register of Marriages," the "Register of Births," and the "Register of Deaths," in which the marriages, births, and deaths certified to him must be numbered in the order in which they are reported to him. There must be stated in each register, in separate columns, properly headed, the various facts contained in the certificates, and the name and official or clerical position of the person making the report. The Recorder must carefully examine each report, and register the same marriage, birth, or death but once, although it may be reported by different persons. [In effect March 16, 1878.]

SEC. 3080. The County Recorder must, every three months, transmit to the Secretary of the State Board of Health, at Sacramento City, a certified abstract of the registers of births, marriages, and deaths, prepared in the manner prescribed in the instructions of the Secretary, and upon blanks to be furnished by him for that purpose.

SEC. 3081. County Recorders, in those counties where their compensation is by fees, shall be allowed by the Board of Supervisors a fee of not exceeding ten cents for each name reported, to be paid out of the General Fund of the county; and in those counties where their compensation is by a fixed salary, the duties in this chapter provided shall be performed without compensation other than such salary. [In effect March 16, 1878.]

SEC. 3082. Any person on whom a duty is imposed by this chapter who fails, neglects, or refuses to perform the same as herein required, is liable to a penalty of fifty dollars, to be recovered by the District Attorney of the proper county for the use of the General Fund of such county.

SEC. 3083. The Secretary of the State Board of Health must prepare blank forms of said registers for the State Printer, who must print as many copies as the said Secretary shall direct, and deliver the same to the Secretary of State, who shall forward the same, from time to time, and in such numbers as shall be directed by the Secretary first mentioned, to the County Recorders of the several counties, who must carefully keep and distribute the same to the persons in the county who are required to keep the registers and make the reports provided in this chapter. [In effect March 16, 1878.]

SEC. 3084. No person shall inter, cremate, or otherwise dispose of any human body, in any city, county, or city and county, without having first obtained a permit therefor. In incorporated cities, or counties, or cities and counties, the permit must be obtained from the person authorized to grant the same by any law, ordinance, or resolution passed for that purpose. But in the absence of such law, ordinance, or resolution, the permit must be obtained from either the Coroner, or Health Officer, Board of Health, or if the Coroner be absent, then from the Health Officer or Board of Health; and if there be no Board of Health or Health Officer, then from a Justice of the Peace. The person applying for a per-

mit must produce and file with the officer issuing the permit a certificate signed by a physician, or a Coroner, or two reputable citizens, setting forth as near as possible the name, age, color, place of birth, occupation, date, locality, and cause of death of deceased. And no permit shall be granted without the production of such certificate. Such permit must be filed with the County Recorder, and the person so filing is entitled to the compensation provided for in section three thousand and seventy-seven of this Code, but if any other registration of the death of the deceased shall have been made, the Recorder must record the name but once. [Approved February 25, 1889; in effect thirty days after.]

PART IV—Of the Government of Counties, Cities, and Towns.

TITLE II—The Government of Counties.

CHAPTER II.

THE BOARD OF SUPERVISORS.

ARTICLE II.

GENERAL PERMANENT POWERS.

SEC. 4046. The Boards of Supervisors, in their respective counties, have jurisdiction and power, under such limitations and restrictions, as are prescribed by law:

* * * * *

20. To adapt to the county the provisions in this Code for the preservation of the health of San Francisco or Sacramento, for such limited time as they may deem proper, and to provide for the expense thereof.

ADDITIONAL STATUTES OF CALIFORNIA.

CHAPTER CCXXIX.

An Act to provide for the grading of public alleys and the construction of sewers therein in the city of Sacramento.

[Approved March 21, 1868.]

SECTION 1. Whenever the Board of Trustees of the city of Sacramento shall deem it expedient to construct a sewer in any public alley, they may order such sewer to be constructed, after having published a notice of such intention in some daily newspaper printed in said city, for the period of ten days, unless the owners of more than one half in

extent of the land and lots bisected by such alley shall have made written objections thereto, and delivered the same to the Clerk of said Board of Trustees within the said period of ten days.

SEC. 2. If the owners, or their duly authorized agents, of more than one half in extent of the lands and lots in any block of land bisected by any such alley shall petition said Board of Trustees, in writing, to cause a sewer to be constructed through the same, the said Board of Trustees shall order the same to be done; or whenever the Board of Health of the city of Sacramento shall, by an order duly made and entered on their records, declare that it is necessary for the public health or cleanliness that a sewer should be constructed in any public alley in said city, and shall have delivered a certified copy of said order to the Board of Trustees, the said Board of Trustees shall order such sewer or sewers constructed, and proceed in the same manner as if said work had been petitioned for by the requisite number of property owners, as above. The cost of constructing that portion of all sewers that extend across streets, or that extends from the line of the block to the main sewer, shall be paid by the city out of the Special Street Fund.

CHAPTER CCCXXXIV.

An Act to authorize the establishment of a Board of Health in the city of Sacramento.

[Approved March 27, 1868.]

SECTION 1. The Board of Trustees of the city of Sacramento shall have power to establish, by ordinance, a Board of Health for the city of Sacramento. Said Board of Health shall consist of five practicing physicians, who shall each be graduates of a medical college of recognized respectability, and the President of the Board of Trustees shall be ex officio President of the Board of Health.

SEC. 2. The Board of Health shall have a general supervision of all matters appertaining to the sanitary condition of said city; and full powers are hereby given to said Board to adopt such measures and make such orders and regulations as at any time, in their opinion, the public safety may require, and not in contravention of any law; but such orders and regulations shall not take effect until approved by resolution or order of the Board of Trustees of said city.

SEC. 3. The Trustees of said city shall by ordinance provide, in such manner as to them shall seem best, for enforcing such orders and regulations as the Board of Health shall from time to time adopt.

SEC. 4. The Board of Health now recognized by an ordinance passed by the Trustees of said city, shall continue to perform the duties pertaining to their office until their successors are duly appointed and qualified.

SEC. 5. This Act shall take effect from and after its passage.

CHAPTER CCCXLVI.

An Act amendatory of and supplementary to an Act to authorize the establishment of a Board of Health in the city of Sacramento, approved March 27, 1868.

[In effect March 29, 1870.]

SECTION 1. The Board of Trustees of the city of Sacramento shall have power, and it is hereby made their duty, to establish by ordinance a Board of Health for the city of Sacramento. Said Board of Health shall consist of five practicing physicians, who shall each be graduates of a medical college of recognized respectability, and the President of the Board of Trustees shall be ex officio President of the Board of Health.

SEC. 2. The Board of Health of the city of Sacramento now recognized by the Board of Trustees shall have a general supervision of all matters appertaining to the sanitary condition of said city, and full powers are hereby given to said Board of Health over all questions of foul or defective drainage, and of the disinfecting and cleaning of streets, alleys, cellars, cesspools, or nuisances of any description, and of low places within the city limits calculated to receive and retain unhealthy deposits.

SEC. 3. The Board of Health shall exercise a general supervision over the death records of the city of Sacramento, and adopt such forms and regulations for the use and government of physicians, undertakers, and Superintendents of Cemeteries as in their judgment may be best calculated to secure reliable statistics of the mortality in said city and prevent the spread of disease.

SEC. 4. The Board of Trustees of the city of Sacramento shall, by ordinance or otherwise, provide for enforcing such orders and regulations as the Board of Health may from time to time adopt; and in times of epidemics, or when deemed necessary by the Board of Health, a Health Officer shall be employed to enforce the laws in relation to the sanitary condition of said city.

SEC. 5. All expenses necessarily incurred in carrying out the provisions of this Act shall be provided for by the Board of Trustees of the city of Sacramento, who are hereby authorized and directed to make appropriation therefor out of the special fund called the Street Fund in the Act entitled an Act to amend an Act to incorporate the city of Sacramento, approved April twenty-fifth, eighteen hundred and sixty-three, approved March eighteenth, eighteen hundred and seventy.

CHAPTER CCCCXL.

An Act to confer further powers on the Board of Trustees of the city of Sacramento.

[Approved March 31, 1876.]

SECTION 1. The Board of Trustees of the city of Sacramento are hereby authorized and empowered, and it is made their duty, to require all lots, and portions of lots, in the city of Sacramento, north of R

Street, west of Fourteenth Street, south of that portion of the north levee lying east of Sixth Street, south of that portion of I Street lying west of Sixth Street and east of the Sacramento River, which are covered with stagnant water a portion of the year, to be filled up to such level or grade as will prevent the same from being so covered.

SEC. 2. Whenever said Board shall declare a lot or portion of lot to be included within the provisions of section one herein, they shall cause to be entered in their minutes of proceedings an order, which may be in substance in the following form: The Board of Trustees of the city of Sacramento hereby determine that (here describe the real estate) is covered with stagnant water portions of the year. It is therefore ordered that the owner or owners thereof fill up the same to a proper level, to be fixed by the City Surveyor, or that the same be filled up at his or their expense. The owner of any lot, or portion thereof, included in such order, may at any time prior to awarding a contract for doing the work, as provided in section three herein, present and file with the Board a protest against the filling up of such lot as contemplated by the order, on the ground that such lot, or portion thereof, is not, during any portion of the year, covered with stagnant water. And if, on a hearing of such protest, the Board finds the same to be true, they shall, by their order, exclude such lot, or portion of a lot, from their original order; but if the Board finds the protest to be not true, they shall proceed as if no protest had been presented and filed. [Amendment of March 30, 1878.]

* * * * *

[Other sections relate to fixing grade, awarding contracts, assessment and payment of costs.]

CHAPTER CCXXXII.

[Stats. of 1875-6, p. 306.]

SECTION 4. No person, master, captain, or conductor in charge of any boat, vessel, railroad car, or public or private conveyance, shall receive for transportation, or shall transport, the body of any person who has died within the limits of the City and County of San Francisco, without obtaining a permit for the same from the Health Officer, which permit must accompany the body to its destination; and no person, master, captain, or conductor, as aforesaid, shall bring into or transport through the said city and county the dead body of any person, unless it be accompanied with a certificate from some proper authority of the place whence it came, stating name, age, sex, and cause of death, which certificate shall be filed at the Health Office; *provided*, that in no case shall the body of any person who died of a contagious disease be brought to the city within one year of the day of death.

CHAPTER DCLXXIII.

An Act to protect public health from infection caused by exhumation and removal of the remains of deceased persons.

[In force May 1, 1878.]

SECTION 1. It shall be unlawful to disinter or exhume from a grave, vault, or other burial place, the body or remains of any deceased person, unless the person or persons so doing shall first obtain, from the Board of Health, Health Officer, Mayor, or other head of the municipal government of the city, town, or city and county, where the same are deposited, a permit for said purpose. Nor shall such body or remains disinterred, exhumed, or taken from any grave, vault, or other place of burial or deposit, be removed or transported in or through the streets or highways of any city, town, or city and county, unless the person or persons removing or transporting such body or remains shall first obtain from the Board of Health, or Health Officer (if such Board or officer there be), and from the Mayor or other head of the municipal government of the city or town, or city and county, a permit, in writing, so to remove or transport such body or remains in and through such streets and highways.

SEC. 2. Permits to disinter or exhume the bodies or remains of deceased persons, as in the last section, may be granted, provided the person applying therefor shall produce a certificate from the Coroner, the physician who attended such deceased person, or other physician in good standing cognizant of the facts, which certificate shall state the cause of death, or disease of which the person died, and also the age and sex of such deceased; *and provided further*, that the body or remains of deceased shall be inclosed in a metallic case or coffin, sealed in such manner as to prevent, as far as practicable, any noxious or offensive odor or effluvia escaping therefrom, and that such case or coffin contains the body or remains of but one person, except where infant children, of the same parent or parents, or parent and children, are contained in such case or coffin. And the permit shall contain the above conditions, and the words: "Permit to remove and transport the body of ———, age———, sex———," and the name, age, and sex shall be written therein. The officer of the municipal government of the city or town, or city and county, granting such permit, shall require to be paid for each permit the sum of ten dollars, to be kept as a separate fund by the Treasurer, and which shall be used in defraying expenses of and in respect to such permits, and for the inspection of the metallic cases, coffins, and inclosing boxes herein required; and an account of such moneys shall be embraced in the accounts and statements of the Treasurer having the custody thereof.

SEC. 3. Any person or persons who shall disinter, exhume, or remove, or cause to be disinterred, exhumed, or removed, from a grave, vault, or other receptacle or burial place, the body or remains of a deceased person without a permit therefor, shall be guilty of a misdemeanor, and be punished by a fine not less than fifty nor more than five hundred dollars, or by imprisonment in the County Jail for not less than thirty days nor more than six months, or by both such fine and imprisonment. Nor shall it be lawful to receive such body, bones, or remains on any

vehicle, car, barge, boat, ship, steamship, steamboat, or vessel for transportation in or from this State, unless the permit to transport the same is first received, and is retained in evidence by the owner, driver, agent, superintendent, or master of the vehicle, car, or vessel.

SEC. 4. Any person or persons who shall move or transport, or cause to be moved or transported, on or through the streets or highways of any city or town, or city and county, of this State, the body or remains of a deceased person, which shall have been disinterred or exhumed without a permit, as described in section two of this Act, shall be guilty of a misdemeanor, and be punishable as provided in section three of this Act.

SEC. 5. Any person who shall give information to secure the conviction of any person or persons for the violation of the provisions of this Act, shall be entitled to receive the sum of twenty-five dollars, to be paid from the fund collected from fines imposed and accruing under this Act.

SEC. 6. Nothing in this Act contained shall be taken to apply to the removal of the remains of deceased persons from one place of interment to another cemetery or place of interment within this State; *provided*, that no permit shall be issued for the disinterment or removal of any body unless such body has been buried for one year or more, without the written consent of the Mayor, Chairman of the Board of Supervisors, or City Council of any municipality of the State. [As amended and passed, March, 1889.]

CHAPTER CCXLVII.

An Act authorizing the Mayor and Common Council of the City of San José to establish and provide for the maintenance of a Board of Health.

[Approved March 16, 1878.]

SECTION 1. The Mayor and Common Council of the city of San José may establish, by ordinance, a Board of Health therefor, to consist of five regular practicing physicians, graduates of a medical college of recognized respectability.

SEC. 2. The members of the Board hold their offices at the pleasure of the appointing power.

SEC. 3. The Board of Health of the city of San José has a general supervision of all the matters appertaining to the sanitary condition of the city, and make such rules and regulations in relation thereto as are not inconsistent with law.

SEC. 4. The Mayor is ex officio President of the Board. The Board must meet monthly, and at such other times as the President may direct. In the absence of the President, the Board may elect a Chairman, who is clothed with the same power as the President.

SEC. 5. The Health Officer of the city of San José is elected by the Board of Health, and holds office at its pleasure. He must be a graduate of some medical college in good standing, and must reside within the city of San José.

SEC. 6. The Health Officer may perform all acts which Quarantine Officers are usually authorized to perform, and he is the executive officer of the Board of Health.

SEC. 7. The Board of Health may locate and establish pesthouses, and cause to be removed thereto, and kept, any person having a contagious or infectious disease; may discontinue or remove the same, and make such rules and regulations regarding the conduct of the same as are needful.

SEC. 8. The Board of Health may exercise a general supervision over the death records of the city of San José, and may adopt such forms and regulations for the use and governance of physicians, and undertakers, and Superintendent of Cemeteries, as in their judgment may be best calculated to secure reliable statistics of the mortality in the city, and prevent the spread of disease.

SEC. 9. The Mayor and Common Council of the city of San José must, by ordinance or otherwise, provide for enforcing such orders and regulations as the Board of Health may from time to time adopt.

SEC. 10. All expenses necessarily incurred in carrying out the provisions of this article must be provided for by the Mayor and Common Council of the city of San José, who may make appropriation therefor out of the Special Street Fund, if the same is sufficient; if not, they may, by taxation, provide a fund therefor.

SEC. 11. The Mayor and Common Council must fix the compensation of the Board of Health and Health Officer.

CHAPTER CCCXXV.

An Act to provide and maintain a system of sewerage in the city of Petaluma, and to take private lands therefor.

[In effect March 23, 1878.]

SECTION 1. The Board of Trustees of the city of Petaluma are hereby empowered and directed to have surveyed, laid out, established, constructed, and maintained, a general system of sewerage for the city of Petaluma, and for that purpose shall employ a competent engineer to survey, map, and plat such contemplated sewerage, showing the location, length, and size of such sewers, which survey, map, and plat, when completed, with his recommendations, he shall file with the Clerk of the Board of Trustees; upon the filing of which, the Board of Trustees shall give at least ten days' notice, by publication in some newspaper published in said city, of the time and place when they will consider said report and hear objections, and may modify and correct the same; and so modified and corrected shall, by resolution, adopt the same, or any part thereof, as the official map of sewers. The compensation of such engineer, and such assistants as may be required, shall be determined by said Board, and shall be paid by warrant on the Sewer Fund of said city.

SEC. 2. In order to provide for the necessary and proper drainage and sewerage of the city of Petaluma, the Board of Trustees thereof are hereby authorized to procure the right of way by purchase, or condemnation, for such main and lateral sewers or drains as they may deem proper for the sewerage and drainage of said city; such rights of way may be thus secured through lands within the corporate limits, and

also when required through lands adjacent to and without said city, under the provisions of part three, title seventeen, of the Code of Civil Procedure, for the purpose of condemning such lands, or the right of way through the same, to the use of the city for public drains or sewers; *provided*, that the benefits resulting to the land remaining or adjoining may be offset against the value of the land actually taken, as also against any damages resulting to such adjacent land from such improvement.

SEC. 3. The Board of Trustees of the city of Petaluma, in addition to the taxes now authorized by law, are hereby authorized and empowered to levy annually an additional tax on all real and personal property of said city, not to exceed twenty cents on each one hundred dollars, to be levied and collected at the same time and in the same manner as other city taxes, and to be known as the sewer tax, which shall constitute a separate fund, to be known as the "Sewer Fund."

SEC. 4. It shall be the duty of the Board of Trustees to construct, maintain, and keep in repair, according to the general system of sewerage adopted, such sewers as from time to time they may deem necessary for the health and welfare of said city.

SEC. 5. All proceedings, contracts, and work in relation to the construction of sewers under this Act, shall be governed in all respects by the provisions of the city charter in relation to street work, except that no petition of property owners shall be necessary. The Board must not, without the consent of owners of adjacent property, change the width of any sidewalk, after said sidewalk has been constructed, for a period of five years.

CHAPTER CCCIV.

An Act to promote the sanitary condition of towns and villages in Fresno County.

[Approved March 20, 1873.]

SECTION 1. It is unlawful for any person, being a resident within any town or village, incorporated or unincorporated, which contains ten or more dwellings, to have or allow on his, her, or their premises, or permit to accumulate upon the half of any street or alley contiguous thereto, any filth or rubbish, or have any deposit of excrement or other filth upon either, or to permit such premises to become in any manner filthy or in an unhealthy condition.

SEC. 2. Upon the application of any resident of any such town or village, if unincorporated, the Board of Supervisors of the county wherein the same is situate, shall define and place of record in their minutes the limits and boundaries thereof; said Board shall appoint one of the Constables of the township wherein such town or village is situate, and notify him of his appointment, to carry out the provisions of this Act as hereinafter specified.

SEC. 3. It is the duty of such Constable, when so appointed, to inspect the premises of every street, alley, or vacant lot within the limits of the town or village for which he is appointed at least twice during each month, upon the first and third Mondays thereof, and in case that he find that any premises, or the half of any streets or alleys contigu-

ous thereto, have upon them any filth or rubbish, or any deposit of excrement or other filth, he shall give written notice to the owner or occupant of such premises to remove the same; and in case the same be not removed within three days thereafter, he shall cause it to be done and such premises thoroughly cleansed in the manner directed by the Health Officer of the county, if there be one, at the expense of the owner or occupant, including his fee of two dollars for each premises so cleansed by him; and it is the duty of such Health Officer to give written directions to such Constable as to how he shall cleanse premises, and such Health Officer shall, at the request of any citizen, examine any premises and require such Constable to cleanse the same and see that such cleansing is properly and efficiently done.

SEC. 4. If said expenses and fee be not paid on presentation of his itemized account therefor, the Constable may maintain action therefor, including a reasonable attorney's fee, to be fixed by the Court; and from the execution in such action no property of the defendant shall be exempt.

SEC. 5. If the Constable cannot find the owner or occupant of any premises within the limits of the town for personal service of the notice hereinbefore mentioned, such notice may be served by posting the same upon some conspicuous place on such premises.

SEC. 6. For every failure or refusal of the Constable or Health Officer to perform any of their duties under this Act, they shall, respectively, forfeit fifty dollars, to be recovered by action, one half to be paid to any person bringing such action, and the other half into the County Indigent Sick Fund. The sureties of the Constable shall be liable for such penalty; but the Health Officer shall not, in the performance of his duties, be required to go beyond the limits of the town wherein he resides.

SEC. 7. This Act shall take effect immediately, and shall apply only to the county of Fresno.

CHAPTER CCCLXXIV.

An Act to establish a Board of Health for the county of Tulare.

[In effect March 26, 1878.]

SECTION 1. There shall be a Board of Health in and for the county of Tulare, consisting of three practical physicians, who are graduates of some medical college in good standing, two of whom, at least, shall be residents of the city of Visalia; and said Board shall serve without compensation.

SEC. 2. The Board of Supervisors of the county of Tulare, at their next regular meeting in May, eighteen hundred and seventy-eight, shall appoint a Board of Health for said county, one of whom shall hold office for the term of one year thereafter, and one for two years, and the other for three years, to be designated by said Board of Supervisors; and annually thereafter, at their regular meeting in May, said Board of Supervisors shall appoint a member of said Board of Health, who shall hold office for the term of three years; and all vacancies shall be filled by said Board of Supervisors by appointment.

SEC. 3. The Board of Health shall have general supervision of all matters appertaining to the sanitary condition of said county, and full powers are hereby given to said Board to adopt such measures and make such orders and regulations as at any time, in their opinion, the public safety may require, and not in contravention of any law. They shall have power to declare any place where they shall have reason to believe a pestilential, contagious, or infectious disease is probably prevailing to an alarming extent to be an infected place, and to fix the period for so considering such place, notice of which shall be given by posting notices or by publication, as said Board shall deem proper.

SEC. 4. All the necessary expenses incurred by said Board of Health for printing, stationery, etc., shall be allowed by the Board of Supervisors and ordered paid out of the General Fund of said county.

SEC. 5. The Board of Health may appoint a clerk, who shall receive a reasonable compensation for his services, not exceeding two hundred dollars per annum, to be fixed and allowed by the Board of Supervisors and payable out of the General Fund of said county.

SENATE CONCURRENT RESOLUTION No. 25.

Relative to appointment of the members of the State Board of Health to consider the subject of a hospital for consumptives.

[Adopted April, 1880.]

Resolved, the Assembly concurring, That a committee of three members of the State Board of Health, to be designated by the Governor, be and are hereby appointed to consider the subject of a State Hospital for Consumptives, to determine a suitable locality, to investigate the probable cost, to devise a general scheme for the construction and management of such an institution, and to report the results of their investigations to the Legislature at its next session.

ASSEMBLY JOINT RESOLUTION No. 7.

Relative to the procuring of a quarantine depot.

[Adopted April 10, 1880.]

WHEREAS, The city of San Francisco, by reason of its commercial relations with Asiatic ports, is alarmingly exposed to the introduction of contagious diseases; and whereas, the port of San Francisco has no place where passengers and cargo can be landed and the necessary sanitary precautions adopted; therefore, be it

Resolved by the Assembly, the Senate concurring, That our Senators and Representatives are hereby requested to use their utmost endeavors to receive from the General Government a portion of one of the islands in the bay of San Francisco for use as a quarantine depot.

Resolved, That the Governor be requested to transmit a copy of these resolutions to each of our Senators and Representatives in Congress.

ASSEMBLY CONCURRENT RESOLUTION No. 23.

Relative to the establishment of a quarantine station on Angel Island.

[Adopted 1880.]

WHEREAS, It is necessary that some convenient place should be provided for quarantine grounds in the harbor of San Francisco, and near the city; and whereas, the State Board of Health, after the most careful examination, are unable to find any suitable place in said harbor, except the northern end of Angel Island, and near the eastern side thereof; therefore,

Resolved by the Assembly, the Senate concurring, That our Senators be instructed, and our Representatives in Congress be requested, to procure a strip of land jutting out into the bay at the northeastern part of Angel Island, in the harbor of San Francisco, consisting of not more than two acres, from the Government of the United States, as a quarantine station for San Francisco, and, if necessary, to procure the necessary legislation for that purpose.

Resolved, That a copy of these resolutions be forwarded by the Governor to each of our Senators and Representatives in Congress.

CHAPTER XC.

An Act to prevent the introduction of contagious or infectious diseases into the State of California.

[In effect March 15, 1883.]

SECTION 1. Whenever there shall exist, in the opinion of the State Board of Health, imminent danger of the introduction of contagious or infectious diseases into the State of California, by means of railroad communication with other States, the State Board of Health are authorized, and it is hereby made their duty, to make or cause to be made, by an accredited agent or inspector, an inspection of all railroad cars coming into the State at such point, or between such points within the State limits as may be selected for the purpose.

SEC. 2. Such inspection shall be made, where practicable, during the ordinary detention of a train at a station, or while in transit between stations, and in all cases shall be so conducted as to occasion the least possible detention or interruption of travel or inconvenience to the railroad companies, so far as consistent with the purposes of this Act.

SEC. 3. Should the discovery be made of the existence among the passengers of any case or cases of dangerous, contagious, or infectious disease, the said Board of Health, or their agent or inspector, under rules and conditions prescribed by them as being applicable to the nature of the disease, shall have power to cause the side-tracking or detention of any car or cars so infected, to isolate the sick, or remove them to a suitable place for treatment, to establish a suitable refuge station, to cause the passengers and materials in such infected car to be subjected to disinfection and cleansing before proceeding farther into the State,

and, in the case of smallpox, to offer free vaccination to all persons exposed in any car or at any station.

SEC. 4. The sum of five hundred dollars is hereby appropriated out of any moneys in the treasury not otherwise appropriated, to be expended solely for the purposes of this Act, and all expenditures herein authorized shall be specified in an itemized account to be presented to the State Board of Examiners, and paid as other demands on the treasury are paid; *provided*, that in no case shall the sum expended exceed that herein specially appropriated for the purpose.

CHAPTER XIV.

An Act to grant to Boards of Health, or Health Officers, in cities and cities and counties, the power to regulate the plumbing and drainage of, buildings, and to provide for the registration of plumbers.

[In force March 3, 1885.]

SECTION 1. It shall not be lawful for any person to carry on business, or labor as a master or journeyman plumber, in any incorporated city, or in any city and county, in this State, until he shall have obtained from the Board of Health of said city, or city and county, a license authorizing him to carry on business, or labor as such mechanic. A license so to do shall be issued only after a satisfactory examination by the Board of each applicant upon his qualifications to conduct such business, or to so labor. All applications for license, and all licenses issued, shall state the name in full, age, nativity, and place of residence of the applicant or person so licensed. It shall be the duty of the Secretary of each Board of Health to keep a record of all such licenses issued, together with an alphabetical index of the same. [As amended March 9, 1887.]

SEC. 2. A list of all licensed plumbers shall be published in the yearly report of the Health Officer or Board of Health. [As amended March 9, 1887.]

SEC. 3. The drainage and plumbing of all buildings, both public and private, hereafter erected in any city, or city and county, shall be executed in accordance with plans previously approved in writing by the Board of Health of said city, or city and county, and suitable drawings and description of said drainage and plumbing shall, in each case, be submitted to the Board of Health, and placed on file in the Health Office. The said Board of Health is also authorized to receive and place on file drawings and descriptions of the drainage and plumbing of buildings erected prior to the passage of this Act.

SEC. 4. The Board of Supervisors, or other city, or city and county officials, whose duty it is to make appropriation and tax levies for general purposes of such city, or city and county, shall make the necessary appropriations and tax levies, and shall insert the same in the yearly tax levy, to provide for carrying out the provisions of this Act. Such appropriations and tax levy shall be made at the same time and in the same manner as appropriations and tax levies are made for other city, or city and county purposes.

SEC. 5. In any city, or city and county, where there is under existing laws a Health Officer but no Board of Health, such Health Officer shall perform all the duties required by this Act of the Board of Health, until a Board of Health shall be created; and in any city, or city and county, where there is no Health Officer nor Board of Health, the Board of Supervisors, or City Council, or other municipal legislative Board or body, shall create a Board of Health, who shall perform all the duties required by this Act of the Board of Health or Health Officer.

SEC. 6. Any Superior Court, or Judge thereof, shall have power to restrain, by injunction, the continuance of work to be done upon or about buildings or premises where the provisions of this Act have not been complied with, and no undertaking shall be required as a condition to the granting or issuing of such injunction, or by reason thereof.

SEC. 7. Any person violating any of the provisions of this Act shall be deemed guilty of a misdemeanor, and upon conviction shall be punished accordingly.

CHAPTER XXXVIII.

An Act to provide for analyzing the minerals, mineral waters, and other liquids, and the medicinal plants of the State of California, and of foods and drugs, to prevent the adulteration of the same.

[Approved March 9, 1885.]

SECTION 1. The Governor of the State of California shall appoint one of the professors of the State University of California of sufficient competence, knowledge, skill, and experience, as State Analyst, whose duty it shall be to analyze all articles of food, drugs, medicines, medicinal plants, minerals and mineral waters, and other liquids or solids which shall be manufactured, sold, or used within this State, when submitted to him, as hereinafter provided.

SEC. 2. The State Board of Health and Vital Statistics, or medical officers of health of any city, town, or of any city and county, or county, may, at the cost of their respective Boards or corporations, purchase a sample of any food, drugs, medicines, medicinal plants, mineral waters, or other liquids offered for sale in any town, village, or city in this State, and submit the same to the State Analyst, as hereinafter provided; and said Analyst shall, upon receiving such article duly submitted to him, forthwith analyze the same, and give a certified certificate to the Secretary of the State Board of Health submitting the same, wherein he shall fully specify the result of the analysis; and the certificate of the State Analyst shall be held in all the Courts of this State as prima facie evidence of the properties of the articles analyzed by him.

SEC. 3. Any person desiring an analysis of any food, drug, medicine, medicinal plant, soil, mineral water, or other liquid, shall submit the same to the Secretary of the State Board of Health, together with a written statement of the circumstances under which he procured the article to be analyzed, which statement must, if required by him, be verified by oath; and it shall be the duty of the Secretary of the State

Board of Health to transmit the same to the State Analyst, the expenses thereof to be defrayed by the said Board.

SEC. 4. The State Analyst shall report to the State Board of Health the number of all the articles analyzed, and shall specify the results thereof to said Board annually, with a full statement of all the articles analyzed, and by whom submitted.

SEC. 5. The State Board of Health may submit to the State Analyst any samples of food, drugs, medicines, medicinal plants, mineral waters, or other liquids, for analysis, as hereinbefore provided.

SEC. 6. It shall be competent for the Mineralogist of the State of California to submit to the State Analyst any minerals of which he desires an analysis to be made; *provided*, that the cost of the same shall be defrayed by the Mineralogical Bureau.

SEC. 7. The Board of State Viticultural Commissioners shall have the same privileges as are provided for the State Board of Health under this Act, with respect to samples of wines and grape spirits, and of all liquids and compounds in imitation thereof; and any person or persons desiring analyses of such products shall submit the same to the Secretary of the said Board of State Viticultural Commissioners, and the same shall be transmitted to the State Analyst, in the manner prescribed in section three of this Act. The analyses shall be made, and the certificates of the State Analyst shall be forwarded to the Secretary of the said Board of State Viticultural Commissioners, and shall have the same force and effect as provided for in section two of this Act, with respect to analyses made for the State Board of Health.

CHAPTER XXII.

An Act to appropriate money to prevent the introduction of contagious and infectious diseases.

[In force March 4, 1887.]

SECTION 1. The sum of ten thousand dollars is hereby appropriated out of the General Fund in the State Treasury, to be expended by the State Board of Health, under the direction of the Governor, for the prevention of the introduction of any contagious and infectious diseases into the State. The claims for such expenditures must be audited by the Board of Examiners; except that when a contingency arises, which, in the opinion of the Governor, demands the immediate use of money, the Controller may draw his warrant, upon the order of the Governor, in such sums, not exceeding one thousand dollars, as he may direct, in the name of the State Board of Health; *provided*, that an account must be thereafter filed with the Board of Examiners, and audited by it, and transmitted to the Controller, showing the manner of such expenditure.

CHAPTER XXIV.

An Act to encourage and provide for a general vaccination in the State of California.

[In force February 20, 1889.]

SECTION 1. The Trustees of the several common school districts in this State, and Boards of common school government in the several cities and towns, are directed to exclude from the benefits of the common schools therein any child or any person who has not been vaccinated, until such time when said child or person shall be successfully vaccinated; *provided*, that any practicing and licensed physician may certify that the child or person has used due diligence and cannot be vaccinated so as to produce a successful vaccination, whereupon such child or person shall be excepted from the operation of this Act.

SEC. 2. The Trustees or local Boards, annually, or at such special times to be stated by the State Board of Health, must give at least ten days' notice, by posting a notice in two or more public or conspicuous places within their jurisdiction, that provision has been made for the vaccination of any child of suitable age who may desire to attend the common schools, and whose parents or guardians are pecuniarily or otherwise unable to procure vaccination for such child.

SEC. 3. The said Trustees or Board must, within sixty days after the passage of this Act, and every year thereafter, ascertain the number of children or persons in their respective school districts, or subdivision of the city school government, being of an age suitable to attend common schools, who have not been already vaccinated, and make a list of the names of all such children or persons. It also shall be the duty of said Trustees or Board to provide, for the vaccination of all such children or persons in their respective school districts, a good and reliable vaccine virus wherewith to vaccinate such children or persons who have not been vaccinated. And when so vaccinated to give a certificate of vaccination, which certificate shall be evidence thereof for the purpose of complying with section one.

SEC. 4. The necessary expenses incurred by the provisions of this Act shall be paid out of the common school moneys apportioned to the district, city, or town. And if there be not sufficient money, the Trustees must notify the Board of Supervisors of the amount of money necessary, and the Board must, at the time of levying the county tax, levy a tax upon the taxable property in the district sufficient to raise the amount needed. The rate of taxation is ascertained by deducting fifteen per cent for delinquencies from the assessment, and the rate must be based upon the remainder. The tax so levied must be computed and entered upon the assessment roll by the County Auditor, and collected at the same time and in the same manner as State and county taxes, and when collected shall be paid into the county treasury for the use of the district.

SEC. 5. The Trustees of the several school districts of this State are hereby required to include in their annual report, and report to the Secretary of the State Board of Health, the number in their several districts between the ages of five and seventeen years who are vaccinated and the number unvaccinated.

CHAPTER V.

An Act to provide for the proper sanitary condition of factories and workshops, and the preservation of the health of the employes.

[In force February 6, 1889.]

SECTION 1. Every factory, workshop, mercantile or other establishment, in which five or more persons are employed, shall be kept in a cleanly state and free from the effluvia arising from any drain, privy, or other nuisance, and shall be provided, within reasonable access, with a sufficient number of water-closets or privies for the use of the persons employed therein. Whenever the persons employed as aforesaid are of different sexes, a sufficient number of separate and distinct water-closets or privies shall be provided for the use of each sex, which shall be plainly so designated, and no person shall be allowed to use any water-closet or privy assigned to persons of the other sex.

SEC. 2. Every factory or workshop in which five or more persons are employed shall be so ventilated while work is carried on therein that the air shall not become so exhausted as to be injurious to the health of the persons employed therein, and shall also be so ventilated as to render harmless, as far as practicable, all the gases, vapors, dust, or other impurities generated in the course of the manufacturing process or handicraft carried on therein, that may be injurious to health.

SEC. 3. No basement, cellar, underground apartment, or other place which the Commissioner of the Bureau of Labor Statistics shall condemn as unhealthy and unsuitable, shall be used as a workshop, factory, or place of business in which any person or persons shall be employed.

SEC. 4. If in any factory or workshop any process or work is carried on by which dust, filaments, or injurious gases are generated or produced that are liable to be inhaled by the persons employed therein, and it appears to the Commissioner of the Bureau of Labor Statistics that such inhalation could, to a great extent, be prevented by the use of some mechanical contrivance, he shall direct that such contrivance shall be provided, and within a reasonable time it shall be so provided and used.

SEC. 5. Every person, firm, or corporation employing females in any manufacturing, mechanical, or mercantile establishment shall provide suitable seats for the use of the females so employed, and shall permit the use of such seats by them when they are not necessarily engaged in the active duties for which they are employed.

SEC. 6. Any person or corporation violating any of the provisions of this Act shall be punished by a fine of not less than fifty nor more than one hundred dollars for each offense.

SEC. 7. It shall be the duty of the Commissioner of the Bureau of Labor Statistics to enforce the provisions of this Act.

CHAPTER CXLVIII.

An Act to create the office of Attorney for the State Board of Health and the Board of Health of the City and County of San Francisco.

[Approved March 31, 1891.]

SECTION 1. The office of Attorney for the State Board of Health and the Board of Health of the City and County of San Francisco is hereby created; such attorney shall be appointed by the Governor, and shall hold his office as such attorney for the term of four years, and until his successor is elected and qualified.

SEC. 2. It shall be the duty of such attorney to act for and represent the State Board of Health and the Board of Health of the City and County of San Francisco in all legal matters which may require their attention as such Boards of Health, and to specially represent and act for and in coöperation with said Boards of Health, when required by them, in the prevention of all acts and things which, in the judgment of said Boards of Health, or either of them, may have a tendency to be detrimental to the health of the people of the State; and in such other matters pertaining to the health of the State in general and the duties of said Boards of Health, to assist and aid them with his advice, and to represent and act for them in Court.

SEC. 3. The salary of such attorney shall be three thousand dollars per annum, and shall be paid out of the State Treasury, upon warrants drawn by the Controller, in the same manner as the salaries of other State officers are paid.

SEC. 4. All Acts and parts of Acts in conflict with this Act are hereby repealed.

SEC. 5. This Act shall take effect and be in force from and after its passage.

PENAL CODE.

PART I, TITLE IX, CHAPTER VII.

RELATIVE TO THE SMOKING OF OPIUM.

SEC. 307. Every person who opens and maintains, to be resorted to by other persons, any place where opium, or any of its preparations, is sold or given away, to be smoked at such place, and any person who at such place sells or gives away any opium, or its said preparation, to be there smoked or otherwise used, and every person who visits or resorts to any such place for the purpose of smoking opium, or its said preparations, is guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding five hundred dollars, or imprisonment in the county jail not exceeding six months, or by both such fine and imprisonment. [In effect March 4, 1881.]

PART I, TITLE X.

OF CRIMES AGAINST THE PUBLIC HEALTH.

- SECTION 370. Public nuisance defined.
 371. Unequal damage.
 372. Maintaining a nuisance a misdemeanor.
 373. Establishing or keeping pesthouses within cities, towns, etc.
 374. Putting dead animals in streets, rivers, etc.
 376. Violation of quarantine laws by masters of vessels.
 377. Willful violation of health laws.
 378. Neglecting to perform duties under health law.
 380. Apothecary omitting to label drugs, or labeling them wrongfully, etc.
 382. Adulterating food, drugs, liquors, etc.
 383. Disposing of tainted food, etc.
 394. Exposing person infected with any contagious disease in a public place.
 400. Using or exposing animal with glanders.
 401. Animal having glanders to be killed.
 402. Adulterating candy.

SEC. 370. Anything which is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property, by an entire community or neighborhood, or by any considerable number of persons, or unlawfully obstructs the free passage or use, in the customary manner, of any navigable lake, or river, bay, stream, canal, or basin, or any public park, square, street, or highway, is a public nuisance. [In effect July 1, 1874.]

SEC. 371. An act which affects an entire community or neighborhood, or any considerable number of persons, as specified in the last section, is not less a nuisance because the extent of the annoyance or damage inflicted upon individuals is unequal. [In effect July 1, 1874.]

SEC. 372. Every person who maintains or commits any public nuisance, the punishment for which is not otherwise prescribed, or who willfully omits to perform any legal duty relating to the removal of a public nuisance, is guilty of a misdemeanor.

SEC. 373. Every person who establishes or keeps, or causes to be established or kept, within the limits of any city, town, or village, any pesthouse, hospital, or place for persons affected with contagious or infectious diseases, is guilty of a misdemeanor.

SEC. 374. Every person who puts the carcass of any dead animal, or the offal from any slaughter-pen, corral, or butcher shop, into any river, creek, pond, reservoir, stream, alley, public highway, or road in common use, or who attempts to destroy the same by fire within one fourth of a mile of any city, town, or village, and every person who puts the carcass of any dead animal, or any offal of any kind, in or upon the borders of any stream, pond, lake, or reservoir, from which water is drawn for the supply of the inhabitants of any city, city and county, or any town, in this State, so that the drainage from such carcass or offal may be taken up by or in such stream, pond, lake, or reservoir, or who allows the carcass of any dead animal, or any offal of any kind, to remain in or upon the borders of any such stream, pond, lake, or reservoir, within the boundaries of any lands owned or occupied by him, or who keeps any horses, mules, cattle, swine, sheep, or live stock of any kind, penned, corraled, or housed on, over, or on the borders of any such stream, pond, lake, or reservoir, so that the waters thereof shall become polluted by reason thereof, is guilty of a misdemeanor, and

upon conviction thereof shall be punished as prescribed in section three hundred and seventy-seven of this Code. [In effect March 23, 1876.]

SEC. 376. Every master of a vessel subject to quarantine or visitation by the quarantine officer, arriving in the port of San Francisco, who refuses or omits—

1. To proceed with and anchor his vessel at the place assigned for quarantine, at the time of his arrival; or,

2. To submit his vessel, cargo, and passengers to the examination of the quarantine officer, and to furnish all necessary information to enable that officer to determine to what length of quarantine and other regulations they ought, respectively, to be subject; or,

3. To remain with his vessel at the quarantine during the period assigned for her quarantine, and while at quarantine to comply with the regulations prescribed by law, and with such as any of the officers of health, by virtue of authority given them by law, shall prescribe in relation to his vessel, his cargo, himself, his passengers, or crew, is punishable by imprisonment in the county jail not exceeding one year, or by fine not exceeding two thousand dollars, or both. [In effect March 9, 1878.]

SEC. 377. Every person who is charged with a duty relating to the registration of deaths, under chapter three, title seven, of the Act to establish a Political Code, approved March twelfth, eighteen hundred and seventy-two, who—

1. Willfully fails to keep a registry of the name, age, residence, and time of death of a decedent; or,

2. Willfully fails to register with the County Recorder a certified copy of such register, as is provided for in said chapter; or,

3. Willfully inters, cremates, or otherwise disposes of any human body, in any city, county, or city and county, without having first obtained a permit, as provided for in said chapter; or,

4. Willfully grants a permit for the interment, cremation, or disposition of a dead human body, without the certificate provided for in said chapter; or,

5. Willfully violates any of the laws of this State relating to the preservation of the public health—

Is guilty of a misdemeanor, and is, unless a different punishment for such violation is prescribed by this Code, punishable by imprisonment in the county jail not exceeding one year, or by fine not exceeding one thousand dollars, or by both such fine and imprisonment. [Approved February, 1889.]

SEC. 378. Every person charged with the performance of any duty under the laws of this State relating to the preservation of the public health, who willfully neglects or refuses to perform the same, is guilty of a misdemeanor.

SEC. 380. Every apothecary, druggist, or person carrying on business as a dealer in drugs or medicines, or person employed as clerk or salesman by such person, who, in putting up any drugs or medicines, or making up any prescription, or filling any order for drugs or medicines, willfully, negligently, or ignorantly omits to label the same, or puts an untrue label, stamp, or other designation of contents, upon any box, bottle, or other package containing any drugs or medicines, or substitutes a different article for any prescribed or ordered, or puts up a

greater or less quantity of any article than that prescribed or ordered, or otherwise deviates from the terms of the prescription or order which he undertakes to follow, in consequence of which human life or health is endangered, is guilty of a misdemeanor, or if death ensues, is guilty of a felony.

SEC. 382. Every person who adulterates or dilutes any article of food, drink, drug, medicine, spirituous or malt liquor, or wine, or any article useful in compounding them, with a fraudulent intent to offer the same, or cause or permit it to be offered for sale as unadulterated or undiluted, and every person who fraudulently sells, or keeps, or offers for sale the same as unadulterated or undiluted, is guilty of a misdemeanor.

SEC. 383. Every person who knowingly sells, or keeps, or offers for sale, or otherwise disposes of any article of food, drink, drug, or medicine, knowing that the same has become tainted, decayed, spoiled, or otherwise unwholesome or unfit to be eaten or drank, with intent to permit the same to be eaten or drank, is guilty of a misdemeanor.

SEC. 394. Every person who willfully exposes himself, or another, afflicted with any contagious or infectious disease, in any public place or thoroughfare, except in his necessary removal in a manner the least dangerous to the public health, is guilty of a misdemeanor.

SEC. 400. Any person, persons, company, or corporation, who shall bring, or cause to be brought, or aid in bringing into this State any sheep, hog, horse, or cattle of any kind, or any domestic animals of any kind, knowing the same to be affected with any contagious or infectious diseases, shall be guilty of a misdemeanor. [As amended and approved March 19, 1889.]

SEC. 401. Every person who adulterates candy, by using in its manufacture terra alba, or any other deleterious substance or substances, or who sells, or keeps for sale, any candy or candies adulterated with terra alba, or any other deleterious substance or substances, is guilty of a misdemeanor. [In effect March 16, 1878.]

SEC. 402. Every animal having glanders or farcy shall at once be deprived of life by the owner or person having charge thereof, upon discovery or knowledge of its condition; and any such owner or person omitting or refusing to comply with the provisions of this section shall be guilty of a misdemeanor. [In effect April 16, 1880.]

OTHER PENAL STATUTES.

CHAPTER CXCV.

An Act to encourage the production and sale of pure and wholesome milk, and to prohibit and punish the production or sale of unwholesome or adulterated milk.

[Approved March 12, 1870.]

SECTION 1. It shall be unlawful for any person or persons to sell, exchange, or distribute, or expose for sale, exchange, or distribution, any impure, adulterated, or unwholesome milk; or to adulterate any milk for

the purpose of offering the same for sale, exchange, or distribution; or to keep any cows for the production of milk for market, sale, exchange, or distribution, in a crowded and unhealthy condition; or to feed the same on any food which would produce impure, diseased, or unwholesome milk; and every person or persons who shall engage in or carry on the sale, exchange, distribution, or any traffic in milk, shall have the cans in which the milk is exposed for sale, exchange, or distribution, and the vehicle from which the same is vended, exchanged, or distributed, conspicuously marked with his or their names; also indicating by said mark the locality from whence said milk is obtained or produced, and any sale, distribution, or exchange of any milk in cans or by a vehicle so marked as to convey the idea that said milk was produced from a different locality than it really was, shall be and is hereby forbidden.

SEC. 2. Any person violating any of the provisions of this Act shall be deemed guilty of a misdemeanor, and be punished by a fine not less than one hundred dollars for the first offense, and double such amount for each subsequent offense, and by imprisonment according to law, if such fine be not paid. One half of such fine shall be paid to the informer or prosecuting witness, and the other half to the School Fund of the county. And any person may be compelled to testify concerning violations of this Act; but such testimony shall not be used against such witness in any criminal prosecution.

SEC. 3. The Health Officer and Health Inspectors of the City and County of San Francisco shall inform against and diligently prosecute all persons violating the provisions of this Act.

SEC. 4. This Act shall take effect immediately after its passage.

CHAPTER CCCCXCVI.

An Act concerning lodging houses and sleeping apartments.

[In effect April 3, 1876.]

SECTION 1. Every person who owns, leases, lets, or hires to any person or persons, any room or apartment in any building, house, or other structure, within the limits of any incorporated city, or city and county, within the State of California, for the purpose of a lodging or sleeping apartment, which room or apartment contains less than five hundred cubic feet of space, in the clear, for each person so occupying such room or apartment, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof, be punished by a fine of not less than fifty dollars or more than five hundred dollars, or by imprisonment in the county jail, or by both such fine and imprisonment.

SEC. 2. Any person or persons found sleeping or lodging, or who hires for the purpose of sleeping in or lodging in any room or apartment which contains less than five hundred cubic feet of space, in the clear, for each person so occupying such room or apartment, shall be deemed guilty of a misdemeanor, and shall, upon conviction, be punished by a fine of not less than ten nor more than fifty dollars, or by both such fine and imprisonment.

SEC. 3. It shall be the duty of the Chief of Police, or such other

person to whom the police powers of the city are delegated, to detail a competent and qualified officer or officers of the regular force to examine into any violation of any of the provisions of this Act, and to arrest any person guilty of any such violation.

SEC. 4. The provisions of this Act shall not be construed to apply to hospitals, jails, prisons, insane asylums, or other public institutions.

SEC. 5. All Acts or parts of Acts in conflict with the provisions of this Act are hereby repealed.

CHAPTER CLXXXIX.

An Act to regulate the sale of certain poisonous substances.

[Approved April 16, 1880.]

SECTION 1. It shall be unlawful for any person to retail any of the substances poisonous, and by reason thereof dangerous to human life, without distinctly labeling the bottle, box, vessel, or package, and the wrapper or cover thereof in which such substance is contained, with the common or usual name thereof, together with the word "poison," and the name and place of business of the seller. Nor shall it be lawful for any person to retail any of the substances enumerated in either of said schedules to any person, unless, on due inquiry, it is found that the person receiving the same is aware of its poisonous character, and that it is to be used for a legitimate purpose.

SEC. 2. It shall be unlawful for any person to retail any of the substances enumerated herein, unless, before delivering the same, such person shall make, or cause to be made, in a book kept for that purpose only, an entry stating the date of the sale, the name and address of the purchaser, the name and quality of the substance sold, the purpose for which it is stated by the purchaser to be required, and the name of the dispenser. The book required by this Act shall be always open to inspection by the proper authorities. It shall also be the duty of the person dispensing any of the substances enumerated in either of said schedules to ascertain, by due inquiry, whether the name and address given by the person receiving the same are his true name and address, and for that purpose may require such person to be identified.

SEC. 3. Any person who shall dispense any of the substances enumerated in either of said schedules without complying with the regulations herein prescribed, shall, for every such offense, be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be punished by a fine not exceeding five hundred dollars, or by imprisonment in the county jail not exceeding six months, or by both such fine and imprisonment; *provided*, that nothing in this Act shall be so construed as to apply to the prescriptions of any physician authorized to practice medicine under the laws of this State.

SCHEDULE "A."

Arsenic, corrosive sublimate, hydrocyanic acid, cyanite of potassium, strychnia, essential oil of bitter almonds, opium, aconite, belladonna, conium, nux vomica, henbane, tansy, savin, ergot, cotton root, digitalis,

chloroform, chloral hydrate, and all preparations, compounds, salts, extracts, or tinctures of such substances, except preparations of opium containing less than two grains to the fluid ounce.

SCHEDULE "B."

White precipitate, red precipitate, red and green iodides of mercury, colchicum, cantharides, oxalic acid, croton oil, sulphate of zinc, sugar of lead, carbolic acid, sulphuric acid, muriatic acid, nitric acid, phosphorus, and all preparations, compounds, salts, extracts, or tinctures of such substances.

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THIRTEENTH BIENNIAL REPORT
OF THE
STATE BOARD OF HEALTH
OF
CALIFORNIA,

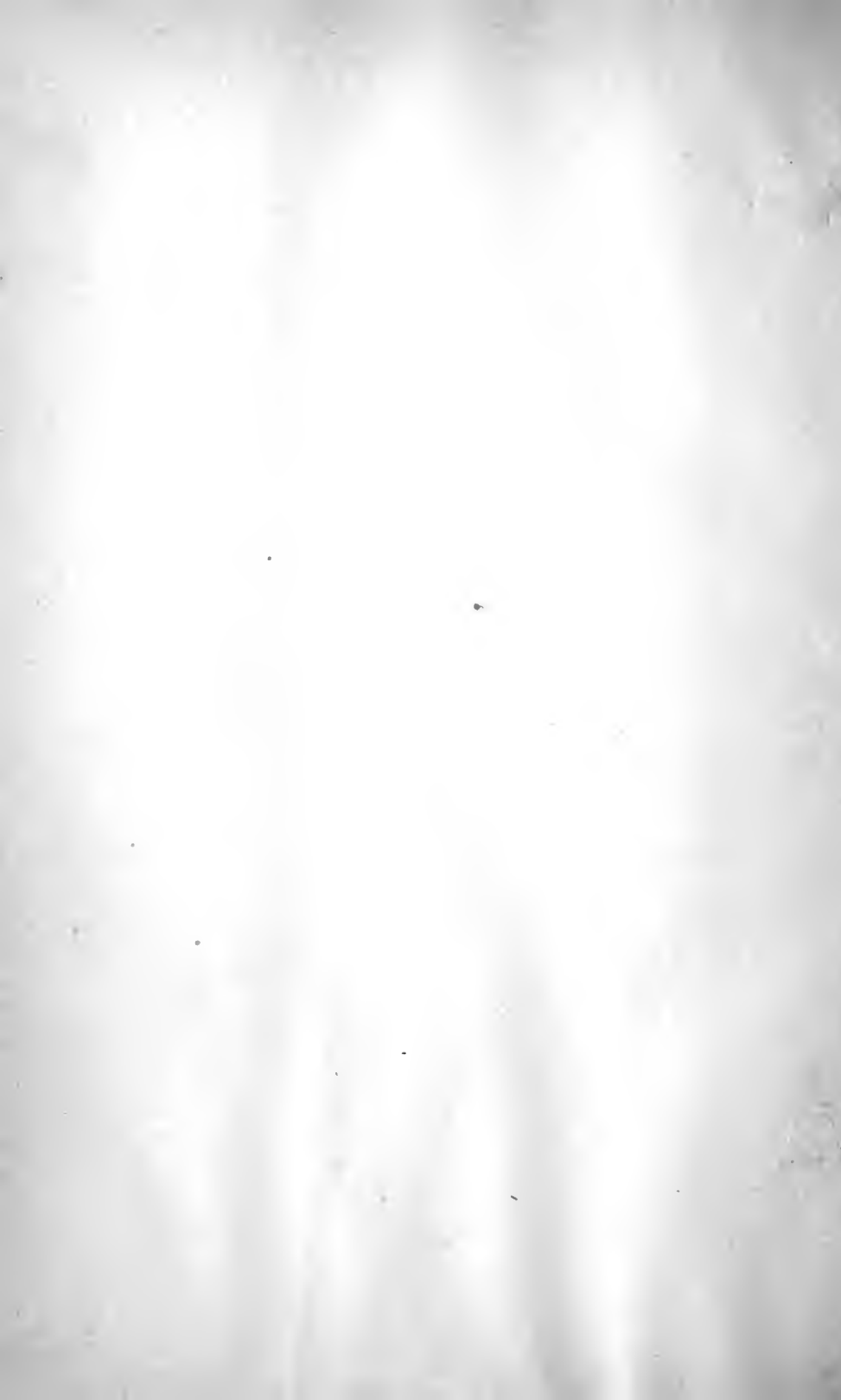
FOR THE FISCAL YEARS FROM JUNE 30, 1892, TO JUNE 30, 1894.

ALSO,

THE TRANSACTIONS OF THE SECOND ANNUAL SANITARY CONVENTION,
HELD AT SAN JOSÉ, APRIL 16, 1894.



SACRAMENTO:
STATE OFFICE, : : : : A. J. JOHNSTON, SUPT. STATE PRINTING.
1894.



OFFICE CALIFORNIA STATE BOARD OF HEALTH, }
SACRAMENTO, September 3, 1894. }

To his Excellency H. H. MARKHAM, Governor of California:

SIR: I have the honor to present to you, in compliance with the laws of the State, the thirteenth Biennial Report of the State Board of Health, for the fiscal year from June 30, 1892, to June 30, 1893, and from June 30, 1893, to June 30, 1894. Also, the proceedings of and papers read at the Second Annual Sanitary Convention, held April 16, 1894, at San José.

Very respectfully,

J. R. LAINE,
Secretary State Board of Health.

MEMBERS OF THE CALIFORNIA STATE BOARD OF HEALTH.

C. A. RUGGLES, M.D.	Stockton.
J. R. LAINE, M.D.	Sacramento.
W. F. WIARD, M.D.	Sacramento.
C. W. NUTTING, M.D.	Etna Mills.
P. C. REMONDINO, M.D.	San Diego.
J. H. DAVISSON, M.D.	Los Angeles.
WINSLOW ANDERSON, M.D.	San Francisco.

OFFICERS OF THE BOARD.

C. A. RUGGLES, M.D.	President.
J. R. LAINE, M.D.	Secretary.

GENERAL REPORT OF THE BOARD.

To his Excellency H. H. MARKHAM, Governor of California:

SIR: Agreeable to an Act establishing a State Board of Health and defining its powers, the thirteenth Biennial Report of the State Board of Health is hereby submitted; also the transactions of, and papers read at, the Second Annual Sanitary Convention held April 16, 1894, at San José.

Soon after the submission of the twelfth Biennial Report it became necessary to send a sanitary inspector to the northern line of the State to guard against smallpox, which prevailed among the population on Puget Sound. A little later grave fears were entertained lest cholera, which prevailed quite extensively in European countries, should effect a landing on the Atlantic shores of this continent and spread among our people. It was deemed advisable, in view of the feverish condition of the public mind, filled with justifiable apprehensions, to place inspectors at or near Truckee, Needles, and Yuma. Hospitals tents were procured and sent to the two last named points, to be used in case it became necessary to detain passengers.

The quarantine detention at New York harbor had, however, been very thorough, and passengers from that point were provided with certificates. In but one instance was it found necessary to detain a passenger train, which occurred on the desert west of Yuma, and for a few hours only. The same precautions were taken in 1893, when cholera again reached New York harbor.

The Board, speaking in behalf of the people of the State of California, express their thanks for your Excellency's recommendation to the Legislature for the appropriation of \$50,000 to be used to prevent the entrance of contagious diseases into the State, and also to the honorable Legislature for their wisdom in carrying out the recommendation.

There is ample reason for the statement that the whole country is now in a better condition to resist an invasion of cholera, or of any other contagious or infectious disease, than at any time during the history of the republic. The preparation for the threatened invasion of the foreign pestilence has had the effect to greatly reduce mortality from local infectious diseases, and this is apparent in a lowering of the death-rate from diphtheria and other contagious diseases, notably in San Francisco and the larger towns throughout the State. As will be seen by the minutes of the Board and from the reports of committees, a careful, and in some instances rigid, inspection of most of the public buildings has been made during the past two years. It has been the policy of the Board to make no strictures on the administration of any institution, confining their observations and reports exclusively to the sanitary arrangements, necessities, and delinquencies, and basing whatever recommendations they have made, upon their personal and official views within their province.

An effort has been made to secure more exact and reliable reports coming under the head of "Vital Statistics," and if a compliance with

the laws of the State can be enforced, a great improvement in this particular will have been attained.

The financial business of the Board will be found in a separate report by the Secretary, as will also tables of mortuary reports, and a detailed statement of the deaths from different causes.

The Board is not prepared to recommend any changes or additions to the laws relating to sanitary matters in the State, believing that a compliance with, and enforcement of those which are now in our statute books will be sufficient for our protection at this time.

We have the honor to be, very respectfully,

C. A. RUGGLES, M.D.

J. R. LAINE, M.D.

W. F. WIARD, M.D.

P. C. REMONDINO, M.D.

C. W. NUTTING, M.D.

WINSLOW ANDERSON, M.D.

J. H. DAVISSON, M.D.

ABSTRACT OF PROCEEDINGS OF THE BOARD, AS SHOWN BY THE MINUTES.

The State Board of Health met in regular session at the office of the Secretary, July 25, 1892.

Present: Dr. C. A. Ruggles and Dr. J. R. Laine.

A letter was read from Dr. Nutting, stating his inability to be present, and a telegram from the President, W. G. Cochran, also stating that he could not be present.

There being no quorum, no business of any official character was transacted; but the matter of placing a Medical Inspector at the northern boundary of the State was determined upon, in case the quarantine of the Puget Sound cities should be raised before the danger from smallpox was certainly past.

The Board then adjourned to meet at the call of the President in San Francisco in August.

AUGUST 15, 1892.

The Legislative Committee of the State and San Francisco Boards of Health, composed of W. G. Cochran, C. A. Ruggles, and J. R. Laine of the State Board, and M. Regensburger and S. F. Long of the San Francisco Board, met at 8 p. m. at the Grand Hotel, San Francisco.

The members of the committee were all present except Dr. S. F. Long.

Some difference of opinion concerning the necessity of legislation was manifested, and a lengthy and general discussion followed with reference to the advisability of establishing a State lazaretto for incurable infectious diseases. The only two diseases coming under that head are leprosy and consumption. Of lepers there are no more than thirty or forty in the State, of whom all but two or three are Chinese. On this meager showing, it was not deemed a matter of sufficient urgency to ask the Legislature to establish a lazaretto for the special care of these few Chinese. Again, it would scarcely do to propose an association of consumptives who are of the Caucasian race, with lepers of the Mongol race in one common lazaretto for the care of those suffering with chronic incurable infectious diseases. This brought the committee to a discussion of a home for incurable consumptives, and of the dangers of infection from germs in phthisical sputa. The opinion finally prevailed that inasmuch as phthisis requires a variety of climate to suit the requirements of different cases, that it was impossible to fix upon a locality which would be advantageous to the greater number. It was urged also that such an institution would induce the indigent consumptives from the whole country to migrate hither, and be maintained at the expense of the State. California has a large death-rate from consumption, due to the migratory habits of this class of incurables, and it was deemed unwise to invite the indigent class also. Aside from consideration of

expense, it was deemed a detriment to the future health of the State to favor the immigration of consumptives to California.

The committee adjourned to meet at the call of the President, W. G. Cochran.

AUGUST 16, 1892.

Drs. W. G. Cochran and J. R. Laine proceeded to Agnews to make a sanitary inspection of the Agnews Insane Asylum.

Dr. C. A. Ruggles resumed his station in the northern part of the State as Inspector for the Board.

The Agnews Asylum is situated on a level stretch of fertile land but little above tide water. The water supply is obtained from an artesian well in the rear of the buildings. The water rises into a covered reservoir, and is pumped directly into the mains. The quality is excellent and the quantity ample and apparently inexhaustible. The closets and lavatories were in a very creditable condition.

The drainage is conveyed from the different parts of the buildings to an eight-inch vitrified stone sewer, through which it flows in a northeasterly direction 3,400 feet, and empties into a creek. This is represented to be a temporary sewer. The sewer is ventilated near the rear of the buildings by a pipe which taps the sewer at its junction with the waste pipes of the premises, and is introduced into a tall smokestack which carries the smoke of the furnaces. The furnace is detached and unconnected from the buildings, and the great draught of the smokestack carried the gases above all possibility of polluting the atmosphere respired by the inhabitants. The asylum is newly built and is modern in construction, and has been maintained in such a manner as not to be deserving of adverse criticism.

The kitchen and dining-hall were scrupulously clean. The kitchen was free from flies; the meats were fresh and the food supplies in the store-room were of good quality. The food prepared for the table at noon was well cooked and to all appearance unobjectionable.

The Board adjourned on the 17th until the next quarterly meeting, but Dr. W. G. Cochran was instructed to remain in San Francisco long enough to confer with the local health authorities, and ascertain what joint measures can be adopted looking to the perfection of general sanitation and local quarantine in case of a visitation by an epidemic of acute contagious disease. He was also instructed to visit the San Quentin Prison and ascertain what has been done towards a compliance with the recommendations of the Board—made at a former visit—and report to the Board. The appointment of Dr. C. A. Ruggles as Medical Inspector, to guard against the introduction of smallpox into the State from British Columbia, was confirmed; and he was directed to return to his station and remain there until all danger from that quarter is passed.

Special meeting of the State Board of Health, September 5, 1892, at 8 o'clock p. m.

The State Board of Health met at the office of the Secretary, J. R. Laine, the full Board being present: W. G. Cochran of Los Angeles (President), W. R. Cluness of Sacramento, P. C. Remondino of San Diego, C. A. Ruggles of Stockton, and C. W. Nutting of Etna Mills.

The Board was thoroughly alive to the necessity of taking immediate action to prevent, if possible, the introduction of cholera into the State, and to use every possible measure to prevent its spread, should it come.

Dr. Cluness, of Sacramento, opened the discussion by saying that while there was a possibility that we would have cholera on this coast, he did not think it was likely that it would be here this year. Even if it got a foothold in New York City, he thought it was so late in the season that its progress would be stayed by frosts, which would at least render the germs of the disease dormant until next summer. While he did not think danger was imminent, something ought to be done in the line of preparation. If we escape the disease this fall, it would be at least possible that it would reach us. He thought the disease had its precursor in diseases at present prevailing among the lower animals, and that the epidemic known as la grippe had prepared our systems for the reception of the germs of cholera. As the grippe prevailed almost universally, the cholera might be expected to prevail generally also. He suggested that the first question was how to prevent it, if possible, and the second was how to deal with it if it became necessary.

Dr. Ruggles stated that he had a bitter experience with the cholera in 1849, and the very name of it made him shudder with apprehension. He had watched its appearance in Europe and had followed its progress closely. He believed the quarantine measures taken on the Atlantic Coast are admirable, and that they were as good as could be taken under the circumstances. The quarantine in the British Possessions, however, he considered almost worthless as a protection, and said he knew the measures taken, if any, at Quebec and Canada points were entirely inadequate. The authorities at Montreal he knew to be careless, and he apprehended that if the cholera reached us it would first come over the Canadian Pacific Railroad. He was in favor of taking immediate steps to post inspectors to examine incoming trains and guard the threatened points. He believed the sentiment of the people demanded that the Board be on the alert and act promptly.

Dr. Remondino said the epidemic la grippe was very severe, and he believed with Dr. Cluness that the cholera would be quite as general. He thought the Board should take measures to impress upon the people that it is at least probable that it will be as universal as the grippe, and urged upon local Boards and health officers the importance of cleaning up everywhere.

Dr. Nutting realized the necessity of action, but had not much faith in land quarantine to stay the progress of cholera. He said, however, it was a good plan to do all we can to take reasonable precaution. He thought it rather early to appoint inspectors, as the disease was not yet on the continent. He thought if the time came when we had it to deal with, it would be a great expense, and that for the time it might be well to depend on the coast quarantine. If we did proceed to quarantine, he believed in doing it thoroughly. The epidemic of a few years ago in Europe did not reach the United States, and he had faith that the cholera would not this time. He said it was wise, however, to take preventive measures and put our house in order.

Dr. Cochran, Chairman of the Board, stated that he called the meeting to take action promptly, and be prepared for activity in any emergency. He suggested that the Secretary, as the executive officer of the Board, should be clothed with certain authority, so as to be ready to

take immediate action. He thought a circular letter should be addressed to local Boards, health officers, and physicians throughout the State, asking coöperation; also, that local inspectors should be stationed to guard and inspect trains on the State's borders, and vessels at coast points.

Dr. Cluness believed with the others, that the appointment of Inspectors might be deferred until later on, but the Board should take steps to educate the people in regard to the threatened approach of the cholera. There were doubtless many people in the State who were not yet aware of its spread in Europe and of the gravity of the situation. He thought it would be well to have some system adopted to tell the people all about the disease. A single educator, like Dr. Laine, might do a great deal. Incidentally he said that the germ of cholera was a tangible thing, and that as long as people did not swallow it they would not be affected. He said it could not be conveyed in the air, and that there were many simple primitive measures that people should know. He did not think a circular letter would reach the people, and suggested that three or four live medical men could do much by inaugurating a system of lectures.

Dr. Laine suggested that as there was but little over \$5,000 in the contagious disease fund, they might find it necessary to exceed that amount, and he wanted to know clearly his authority in regard to the appointment of inspectors and as to other measures.

Dr. Ruggles, who had been engaged in sanitary inspections and measures in British Columbia and on the northern boundary of this State, offered many valuable suggestions as to the proposed establishment of Quarantine Inspectors, location of stations, etc.

Professor Rising, Chemist of the State University, was present, and volunteered to make certain investigations and researches in the medical works of the University, among which are those of the Imperial Board of Health of Germany, in regard to cholera investigation and information.

After a long discussion of the proper measures to be taken, and the main points to be guarded, the Board finally decided to give Secretary Laine authority to take any action considered necessary. The following resolutions were passed:

Resolved, That in view of the probable approach of cholera to the borders of the State, the Secretary is hereby authorized to appoint, for the State Board of Health, competent Medical Inspectors, invested with specific powers, to be placed at the points of entry of the railroads into the State, and at such maritime ports as may require protection, and to go on duty as soon as called upon by the Board through its executive officer.

Resolved, That the Secretary be instructed to request the Governor to supply the necessary tents for field hospital purposes at the land quarantine stations, also such camp equipments as it is possible for the military arm of the State service to supply.

Resolved, That the Secretary be authorized to employ an assistant, who may act as Supervising Inspector and render such other assistance as may be necessary, and that the matter of salaries for Medical Inspectors be left to the Secretary with power to act.

Resolved, That a committee of three be appointed, composed of the Secretary (Dr. Laine), Dr. Cluness, and Dr. Ruggles, to prepare a circular letter on cholera, and the course to be taken during its prevalence, for general distribution to the public.

In view of the general prevalence of smallpox in Lower California, it was suggested by Dr. Remondino, that Dr. C. A. Ruggles, delegate to the Pan-American Public Health Association, a meeting of which is to be held at the City of Mexico, in November, be instructed to confer with the Mexican authorities with a view of causing all residents of the territory of Lower California to be vaccinated.

The meeting then adjourned, to meet in conference with the Board of

Health of San Francisco, and the Secretary was authorized to telegraph a request to Mayor Sanderson to call a meeting of the local Board for the conference at 9 A. M. on the 7th inst.

Dr. M. Gardner appeared before the Board in behalf of the Board of Trustees of the Mendocino Insane Asylum, and invited the Board to make an official visit to that institution at the time of the quarterly meeting in October.

Adjourned special meeting of the State Board of Health, September 7, 1892, 9 A. M., San Francisco, Cal.

Those present were: Mayor Sanderson, in the chair; Drs. W. H. Mays, Bucknall, and Regensburger, of the local Board; Drs. Cochran of Los Angeles, Ruggles of Stockton, Remondino of San Diego, and Laine of Sacramento, of the State Board; Dr. Lawler, State Quarantine Officer, and Dr. Keeney, local Health Officer.

A general discussion took place on the question of quarantine.

Dr. Regensburger thought the greatest danger from cholera infection was not by sea, but by land. He advocated the locking of all entrances to the State the moment cholera was known to be in the country, and that a strict quarantine be enforced. All baggage, freight, and the clothing of passengers should be fumigated, as well as the cars. The passengers and baggage should be put in a new train of cars this side of the border. That was the only way to shut it out.

Dr. Mays concurred.

Dr. Laine saw difficulty in the way of carrying out a strict quarantine. They could not get the National Guard to form an absolute cordon all along the border. He thought a land quarantine impracticable. They could only do that which was practicable.

Dr. Cochran said: We have only an appropriation of \$5,000, and would have to get the State Legislature to make a further appropriation.

The Mayor saw no difficulty in fumigating the baggage. When he was on the Danube the officials opened the baggage, spread out the contents and fumigated them by spraying. Why not do the same here?

Dr. Mays said: We ought to place a cordon at the four main points—Truckee, Ashland, Yuma, and The Needles.

Dr. Ruggles did not think a strict land quarantine practicable. But where there was a suspicious case the car should be side-tracked, the patient taken out and put in a hut or tent. He suggested an alliance between the States of Oregon, Washington, and California, and by acting in concert they could do a great deal of good. The greatest danger was from the Canadian border.

Dr. Cochran thought it quite feasible to stop all cars at the border and prevent them from entering the State.

Dr. Lawler explained the system of fumigating the baggage of passengers by sea. The danger of contagion was not so much in the individual as in the clothing and baggage. There need be no difficulty in fumigating the baggage of passengers by land.

After further discussion, Dr. Mays moved that the Washington authorities be urged to have the new fumigating steamer put in commission at once, which was adopted.

The members of the State Board of Health accompanied Dr. Lawler in his launch to the quarantine station.

Hospital Cove is one of the prettiest spots imaginable. It is surrounded by a range of high hills, which is a safe protection against storms.

The party was met at the landing by Dr. Carmichael, Marine Hospital Surgeon, in charge of the station. The buildings were all inspected thoroughly; they were all in fine condition.

In the sheds erected by the steamship companies, the barracks and the lazaretto there is accommodation for about eight hundred patients. There are three tiers of bunks, each bunk being able to accommodate four patients. At the last quarantine there were about one thousand people on the island.

There are three large cylinders, each forty feet long by eight feet in diameter, strongly supported in cast-iron saddles. Each cylinder has two jackets, and when the clothing or other effects are hung up by the hooks inside, the iron door is closed, a valve is opened, and the heat flows in. Then, if necessary, another valve can be opened to let in steam in the same space between the jackets. The heat can be run up to 300° if necessary, but 200° will kill all microbes.

It is intended to build a house for non-contagious diseases, also additional barracks.

Everything is in ship-shape order, and the members of the State Board expressed themselves as exceedingly well pleased with the appliances, and the situation of the cove.

The meeting adjourned until 3:30 p. m.

At the afternoon meeting Vice-President C. F. Crocker and General Manager A. N. Towne, of the Southern Pacific Company, were present. Dr. Cochran explained the gist of the morning's discussion.

Vice-President Crocker stated that the railroad company was anxious to coöperate with the Board in its efforts to prevent the scourge from entering California. Yet the company did not desire to be restricted so that its interests might suffer needlessly. The company was willing to furnish hospital cars and instruct its employés to aid the health authorities in every way.

General Manager A. N. Towne stated that he would issue any instructions to the Division Superintendents of the Southern Pacific that the health officials might deem pertinent to the subject.

A discussion ensued as to the best means to be adopted, so that while using every precautionary measure, due regard would be paid to the convenience of the traveling public.

Inasmuch as cholera had appeared in South America, a resolution was adopted by the State Board requiring the fumigation of all vessels from South American ports to San Francisco at San Diego. The resolution was also adopted by the local Board.

Upon Dr. Remondino's motion the following resolution was adopted:

Resolved, In view of the fact that the port of San Diego, and those on Puget Sound, are unprotected by efficient and fully equipped quarantine stations, and that vessels touching at those ports are not subject to further quarantine when reaching San Francisco, the California State Board of Health would respectfully urge the immediate equipment of the San Diego and Port Townsend quarantine stations with the most approved form of disinfection apparatus, and that there be also erected such temporary shelter as the probable urgency of the situation may demand.

It is believed that the placing of these stations in as efficient condition as the one at San Francisco will not only protect the maritime ports of the coast, but will assist more

than any other measure to make effective the system of land quarantine contemplated by the State authorities, and at the same time allay public apprehension by a feeling of security due to having made all possible efforts to guard against the epidemic.

The resolution was adopted by the State Board and concurred in by the local Board, and the joint meeting adjourned.

Adjourned special meeting of the State Board of Health, September 8, 1892, at 8:30 A. M.

Present: Drs. Cochran, Ruggles, Remondino, and Laine.

The Secretary read the following communication, which was ordered placed on file:

COLUMBUS, OHIO, August 27, 1892.

DR. J. R. LAINE, *Secretary of the State Board of Health, Sacramento, Cal.:*

DEAR SIR: I have the honor to inform you that, at a meeting of the Executive Committee of the National Conference of the State Boards of Health, held in Indianapolis August 26th, you were appointed a member of the Quarantine Inspection Commission, created by the committee. The other members of the Commission are: Dr. Baker, of Michigan; Dr. McCormack, of Kentucky; Dr. Watson, of New Hampshire; either Dr. Solomon or Dr. Holt, of Louisiana; Dr. Bryce, of Ontario, and Dr. Orramanos, of Mexico.

You are respectfully requested to make an inspection of all quarantine stations of the Pacific Coast; to note their equipment and efficiency of administration, and to report at the earliest possible date to Dr. McCormack, President of the Conference of the State Boards of Health. It is suggested that a preliminary report is desirable soon, a complete report to be made at your earliest convenience.

Expenses of the Commission will be refunded by the Conference.

Yours truly,

C. O. PROBST,
Secretary.

An assessment of \$10 by the International Conference of Boards of Health for the expenses incurred at a late meeting at Indianapolis was ordered paid.

The Secretary was instructed to visit the different quarantine stations on the coast, and also to inspect sites for quarantine camps or refuge stations at points where it may become necessary to establish them.

The following circular was read and placed on file:

CIRCULAR.

Personal Effects and Baggage of Immigrants from all European and Asiatic ports to be Disinfected at Ports of Departure.

1892. }
Department No. 147. }

TREASURY DEPARTMENT, OFFICE OF THE
SUPERVISING SURGEON-GENERAL MARINE HOSPITAL SERVICE,
WASHINGTON, D. C., August 24, 1892. }

To Collectors of Customs, Medical Officers of the U. S. Marine Hospital Service, Agents of Foreign Steamship Lines, Local Quarantine Officers, and others whom it may concern:

Department Circular No. 141, dated August 17, 1892, relative to the disinfection of the personal effects and baggage of immigrants prior to embarkation, is hereby extended to include the baggage and personal effects of immigrants from all European and Asiatic ports; and it is further ordered that the provisions of the circular thus amended shall become operative on and after this date, except for articles of baggage, etc., afloat prior to the promulgation of this order, which must be disinfected on arrival.

H. W. AUSTIN,

Surgeon M. H. S., for the Supervising Surgeon-General.

Approved: CHARLES FOSTER, Secretary.

The Board then adjourned to meet at the call of the President.

Regular meeting State Board of Health, October 24, 1892.

Present: Drs. Cochran, Cluness, Ruggles, and Laine.

The minutes of the three previous meetings were read and approved.

The Secretary reported having appointed three Medical Inspectors during September, agreeable to resolutions passed by the Board at the special meeting held on September 5th.

Dr. P. G. Cotter was appointed to act at Yuma, on the S. P. R. R., and Dr. James P. Booth at Needles, on the A. and P. R. R., while Dr. C. A. Ruggles was sent to the State line near Truckee.

Each Inspector received the same instructions, except as to local points.

Dr. Cotter found it necessary to stop two different trains, detaining passengers at Ogilby Station, 16 miles west of Yuma. In both instances it was found that there was no contagious disease aboard, and the passengers and cars were allowed to proceed.

Six hospital tents were purchased by the Secretary from Neville & Co., of San Francisco, and sent to Dr. Cotter, and six more were sent to Dr. Booth, at Needles. They were paid for out of the contagious disease fund.

A bill of \$154 50 for two special trains, and for ice and water furnished the quarantined passengers at Ogilby by the S. P. R. R. Co., was received.

The salary for a clerk in the office of the Secretary for one month, amounting to \$60, was also reported.

The action of the Secretary was approved, on motion of Dr. Cluness, but the bill of the S. P. R. R. Co. was ordered returned to Dr. Cotter for approval, and then to be sent to George A. Knight, the attorney of the Board, to learn if it is a bill that the State is liable for. When it is so declared by him, the Secretary was instructed to cause it to be paid—otherwise, to hold it, and notify the S. P. R. R. Co. accordingly.

All the other expenses incurred by the Inspectors, including salary of the Secretary's clerk, were ordered paid out of the contagious disease fund.

The Secretary also reported having complied with the instructions of the Board in having had a circular on cholera printed and generally distributed.

His action was approved.

The following report was presented by Dr. Ruggles, and ordered placed on file:

To DR. J. R. LAINE, Secretary State Board of Health:

DEAR SIR: I most respectfully report that early on September 19, 1892, I received a letter from you notifying me of my appointment as Medical Inspector, and requesting me to report at Sacramento immediately for instructions, and to take position on State line between Truckee, Cal., and Reno, Nev. The S. P. R. R. provided me with transportation pass, and a letter to its employes instructing them to cooperate with me in all my endeavors to carry out your instructions.

Upon my arrival at Truckee, I placed myself in communication with the Division Superintendent, who advised me to make Reno, Nevada, my headquarters, as from that point I could move easily and more conveniently, as to time, intercept the trains from the East. To prepare myself for any emergency that might arise, caused me as early as possible to select a suitable location for a quarantine hospital or refuge station. My attention was specially directed to a place near the State line in California, apparently designated by nature for the very purpose. It was well protected from winds by surrounding hills; well wooded, and abundantly and conveniently watered by the Truckee River.

Close proximity to a side-track rendered any lengthy transportation of the sick, or hospital supplies, unnecessary. Satisfactory arrangements were made with the local railroad authorities for spare cars for temporary hospital purposes, and for fumigation and disinfection of baggage and clothing. It was so arranged that by running an engine

side by side with the car designated for fumigation, steam could be easily injected by the locomotive, rendering the fumigation by sulphur much more effective, for experience has taught us that sulphur fumes without moisture are not of much account as a germicide. Upon my arrival at Reno I was soon convinced that it was good sanitary policy to put myself in telegraphic communication with the company's agent at Ogden, whose duty it was to exchange the tickets of all passengers on the Union Pacific and Denver and Rio Grande roads, thus giving him an excellent opportunity of personal inspection of every person to arrive in California over the Central Pacific Railroad. Every morning at 8:30 o'clock I received a message from him, stating his opinion as to the passengers examined by him the day before.

The conductors on all trains, and all other employés, were directed by Mr. Fillmore, General Superintendent, to assist me in every possible manner, and were specially instructed by me to make particular examination of every passenger in their trains, and if any suspicious case should present itself to report to me in person at the depot, on arrival of train at Reno. I then boarded the train, and as soon as the State line was reached, I went through every car, making a particular personal examination of every person. All my previous favorable opinions of the efficiency of the quarantine authorities at New York were fully confirmed by the uniform presentation of the certificate of the proper officer vouching for the faithfulness of the fumigation and disinfection of passengers' baggage and clothing, and the healthy condition of the person at the date of its issuance.

Having detected an unpleasant spirit of jealousy as to California exercising authority in the State of Nevada, I studiously avoided giving any cause for complaint in that line by doing no official act until the train had passed the line dividing Nevada from California.

Upon my arrival at Truckee my examination was completed, and I would return to Reno by freight train, having a special permit to do so from the Division Superintendent, arriving about 4 p. m.; at 8:30 p. m. the evening train from the East, composed of first-class passenger coaches and Pullman cars, would arrive at Reno, the conductors of which would make a personal report to me on their arrival; if there was anything suspicious I would accompany the train to Truckee for personal examination.

During the period of my official career as Medical Inspector for eighteen days I had no occasion to detain either car or passenger. There was quite a number of cases of sickness of different character on the trains, but I found none that justified a moment's detention of passenger or car. My attention was very forcibly directed to the dirty, filthy, and unsanitary condition of the emigrant cars. I notified the proper authorities that cars in such condition should not be allowed to enter California. Soon a great improvement followed.

In conclusion, I wish to state that in all my official connection with railroads, I had the hearty coöperation of all its officers and employés.

C. A. RUGGLES, M.D.

October 22, 1892.

A lengthy discussion concerning quarantine matters was brought to an end by the appointment of Drs. Cochran and Ruggles to locate a station near Yuma, on the west side of the Colorado River, some time in November. This was deemed prudent, so as to equip it and have it ready for any emergency in the spring.

This was deemed necessary because of the expense incurred during the recent cholera alarm, when it was found to be an extremely costly matter to detain people on the desert and properly care for them.

Dr. Cochran believed that the Board should employ a microscopist in Sacramento and at Los Angeles to examine the dejecta of suspected cases of cholera, as only by this means could a diagnosis be determined with certainty as to whether suspected cases were cholera or simple non-contagious disease.

Dr. Cluness thought the matter very important, inasmuch as recent investigations had proven that the cholera germ was found in great numbers in the discharges of persons for a variable length of time prior to an attack of cholera, and for some time after recovery from the disease, which was, in his opinion, sufficient to account for the extreme difficulty of establishing an effectual quarantine against it. He believed that a convalescent could carry the contagion by discharges from the bowels after he was discharged as cured, as the investigations recently made proved that the dejecta still contained cholera germs after the patient was pronounced cured. He believed that competent micros-

copists should be employed by the State Board, in case of an epidemic during the next summer.

The matter was deferred until the next regular meeting.

Dr. C. A. Ruggles was duly elected delegate to the Public Health Association, to meet in Mexico in December.

The State Board of Health met in regular session at 8 p. m., January 30, 1893.

Present: Drs. C. A. Ruggles and J. R. Laine. Communications were received from the other members, giving excuses for not being present. There being no quorum, the Board adjourned to meet at San Francisco on February 10th, to consider such business as may come before it, and to go to Ukiah to inspect the sanitary construction of the Mendocino Asylum for the Insane.

The Board met in regular adjourned session at 8 o'clock p. m., February 10th, at the Palace Hotel, San Francisco.

Present: President Cochran, Drs. C. A. Ruggles and J. R. Laine.

Communications from other members were received, stating sufficient reasons for absence. It was determined to proceed to an examination of the Mendocino Asylum at Ukiah.

The Board arrived at Ukiah February 11th, in company with Thomas L. Carothers, President of the Commission, Dr. E. W. King, C. O'Connor, and Dr. M. Gardner, members of the Commission, in whose company, including also W. G. Copeland, Architect, an inspection was made of the buildings and grounds.

The grounds comprise one hundred and thirty acres of valuable bench and valley land, lying on the east bank of Russian River, about two and one half miles southeast of the town of Ukiah.

The main building, about six hundred feet long, faces the valley to the west, while the mountains rise in imposing heights in the rear toward the east, their base reaching the eastern limits of the State land.

The water supply is obtained from Mill Creek, a stream descending a cañon east of the grounds, and traversing the southern border as it flows into Russian River. The water is taken from Mill Creek one and one half miles from the buildings and is to be conveyed into a reservoir at an elevation of 200 feet above them, and thence by pipes already laid to the points required, where the pressure will be sufficient for fire as well as for domestic and irrigation purposes.

The water is of excellent quality. The site of the building is all that could be desired for salubrity, but it is not as imposing as if it had been placed on a higher elevation, but this could not have been done without a sacrifice of good land and water pressure. The buildings are substantial, and all the expedients of architecture have been adopted to obtain light by windows. The work shows signs of careful supervision. Each wing of three stories, 300 feet in length, meet at a point where the Administration Building is to be attached on the west face of the structure, in the rear of which, extending eastward like a broad stem of the letter "T," is a building attached by a narrow corridor to the ward where the kitchens, dining-rooms, sculleries, pantries, clothes-presses,

store-rooms, and servants' rooms are located on the ground floor, and sewing and sitting-rooms for female patients on the second floor.

The floors and woodwork, while plain, show more finish than is usually observed in a public building.

The ventilation and lighting by windows is unexceptionable, except the kitchen, which is cement floored, 26x34 feet in dimensions, with scullery on east side and pantry on the west, and lighted by four windows on the south side.

These four windows, designed for lighting, are the only means for ventilating the kitchen and carrying away the steam from six or eight large cauldrons for soup, rice, potatoes, and stews, and the smoke from roasting, broiling, and frying ranges, cooking food for five or six hundred people. No provision at all seems to have been contemplated for this purpose, except eight 12-inch flues, four at each end and two on the south side, and it seems likely that unless some modification of the present arrangement is made before the permanent occupation of the premises, much vexation will be experienced because of steam and smoke, which will invade the corridors in seeking an escape. It may be presumption to suggest an expedient without consulting an architect, but the solution of the difficulty appears feasible by only marring the symmetry of the sewing-room above the kitchen: by the construction of square ventilators at each end of the kitchen to carry steam and smoke from the kitchen canopies through the roof, or the construction of two or three cylindrical drum ventilators from the canopies to pierce the roof. If the latter expedient should be adopted, the ventilating drums could be converted into columns in the sewing-room above. A large square ventilator at each end of the kitchen, against the chimneys, would, if sufficient, be the most economical and sightly.

There is a three-story water-closet and bath-room combined, in the rear of each wing of the ward, connected by a narrow corridor; each floor containing two stalls for urinals and two seats over hoppers in the first room, and two porcelain-lined iron tubs in the rear rooms. Each water-closet is intended to accommodate sixty persons; this furnishes two seats for that number of patients, which is deemed altogether inadequate. The Board would recommend that the urinal stalls be increased to four in each closet, and the seats be increased to six, if possible; this should be done before the completion of the buildings for occupancy.

The bakery and laundry are under one roof, and situated almost 200 feet in the rear of store-room and kitchen, on a terrace 10 feet high. This is a two-story brick structure 64 by 130 feet, with cemented floor. The engine-room is situated about 30 feet north of this building. For convenience, the laundry and bakery should have been located on a level with the asylum, so that soiled clothing could be conveyed by car on a tramway to the laundry, and clean clothes returned in the same way. It would be more convenient to convey the 600 or 700 pounds of bread that will be used daily at the asylum, by tramway, than to carry it by hand; as at present contemplated, clothes and bread will be carried between the two buildings.

No provision is made for a chute for soiled clothing. It will be necessary to carry all soiled clothing and bedding down the stairs used as a common stairway, or to send them down the elevator. This will necessitate too frequent handling. An iron chute extending from the third story to the ground, with openings at each story, might be placed

at the angle of junction of the corridor with the main building. All soiled clothing could be dropped down the chute to a car, which should carry them to the laundry and return them clean to the elevator. In order to accomplish this, it will be necessary to continue the tramway from the basement of the kitchen building into the yard in the rear of the terrace, which must either be cut through, or tunneled and arched, to the bakery and laundry, where an elevator may be cheaply improvised, to raise the car on a platform to the level of the floor. The track would be on the division line of the yard and would interfere neither with view nor convenience.

Drainage.—Ample provision has been made for the disposal of waste water from the roof, but no sewers have as yet been constructed for the asylum or the laundry.

The main sewer should begin at a point between the kitchen and the laundry, where it should receive a branch from the laundry and a branch from the kitchen, and still farther north a branch from the north wing closets, the main sewer continuing past the north wing in a northerly direction to the low-lying garden lands one eighth of a mile or more distant, where it may be utilized for irrigation purposes in summer and washed away by the floods in winter.

The water drained from the irrigated land would be free from odor, and run by natural easement, aided by a ditch already constructed, to Russian River. The disposal of the sewage by this simple plan is practical and feasible, and nothing but gross stupidity and a total disregard of the sanitary expedients of recognized merit and utility can give offense.

There may be excuses for the offensive delinquencies of drainage in old institutions, but there can be no condonation for any insufficiency in a new one, with ample fall and easy facilities.

The lighting is by gas, but there will be water enough in Mill Creek to furnish power to light the whole building by electricity during at least six months in the year. Provision should be made for lighting the entire structure, also detached buildings, with electricity. It may be purchased from the city works if it is not desirable to manufacture it.

The State Board of Health met in regular adjourned session February 13, 1893.

Present: Drs. Cochran, Cluness, Ruggles, and Laine.

On motion of Dr. Ruggles the reading of the minutes of the last meeting was dispensed with.

The Secretary reported having been called upon to investigate small-pox at or near San Luis Obispo, and that it was found necessary to send Dr. L. A. Elster as Special Inspector. This action was approved, and it was ordered that Dr. Elster continue to act as Special Inspector during the presence of this disease at that and other points in the State.

Dr. C. A. Ruggles read the following report of his work in selecting a site for a refuge station for quarantine purposes near Yuma, which was received and placed on file:

To DR. J. R. LAINE, Secretary State Board of Health:

I most respectfully report that at the regular session of this Board held September, 1892, a resolution was adopted requesting Drs. Cochran and Ruggles to act as a committee to select a suitable site for quarantine purposes somewhere near Yuma, in the event of

an invasion of cholera. In accordance with said resolution, I proceeded to San Francisco for the purpose of consulting the S. P. R. R. Co., so that we might by concert of action make our selection of a station effective for the desired purpose, with the least inconvenience to the railroad company. In an interview with Mr. Towne, General Manager, I found the company ready and willing to cooperate with your committee, and, to further said project as much as possible, furnished me with an order for a special engine and other accommodations for the purpose of going over the road in our selection of site.

On Tuesday, November 22d, your committee, accompanied by Dr. Price, Health Officer of San Bernardino, by special invitation, met Dr. Cotter, of Yuma, who had been Medical Inspector of the Board at that point, and was able to furnish your committee with much valuable local information. By special car we proceeded about six miles from Yuma, on California side of the Colorado River, to a place known to railroad authorities as "El Rio." We there found many points which admirably fitted this location for a quarantine station. It being near the river assured us plenty of water, and, in fact, the four grand requisites were at hand, viz., wood, water, a switch, and telegraphic communication, easily to be procured.

It was unanimously decided by your committee, concurred in by the medical gentlemen present, to report favorably on this location as a quarantine station, in the event that cholera should invade the State.

The object for which your committee was formed having been satisfactorily accomplished, Dr. Cochran returned to Los Angeles, and I, who had been elected to represent this Board at the Pan-American Public Health Association, to convene at the City of Mexico, proceeded on my journey to that city.

Nothing worthy of mention occurred during the trip, excepting possibly the pleasure of meeting many notable sanitarians, who were traveling from all parts of the United States and Canada, and converging towards one particular road, viz.: Mexican Central Railroad.

The perfection of the arrangements of the Central Committee was very remarkably shown, by a delegation of said committee meeting our train fifteen hours before our arrival, and assigning all the delegates to their proper places, thus avoiding much confusion and trouble that must have otherwise arisen. Our reception all along the line was a perfect ovation, each endeavoring to outdo the other in courtesy and kindness. In cities the municipal authorities would receive us with music and speeches, and in capitals of States the Governors would extend like favors, the band in each and every instance forcibly reminding us of home, by playing "Hail Columbia" and "Yankee Doodle," and our Canadian brother, not to be neglected, was treated to "God Save the Queen." It had been planned for the delegates to stop over one day at Zacatecas, so well known as a locality entirely free from tubercular troubles, and notable for its wonderful silver mines; but we were advised by the Health Officer of the presence of typhus in an epidemic form, therefore we deemed it prudent not to stop. The great majority of the delegates arrived at their journey's end on Sunday, November 27th. The hearty coöperation of President Diaz, and others high in authority, with the Central Committee of Arrangements, prevented the possibility of a doubt as to the success of the reception and entertainment of the association.

It was promptly called to order at 9 A.M., November 29th, at the Chamber of Deputies, by President Formento, of New Orleans, a gentleman of much parliamentary experience, and admirably fitted to control a large assembly of this character. The Secretary reported 576 delegates present, one half of which number were from United States and Canada.

The proceedings were conducted strictly in accordance with the printed programme, in English and Spanish, furnished to the delegates each morning. Each member was furnished with a translation of the paper to be read, which made it very easy to follow along during the reading of it.

A paper was read by the State Health Officer of Texas, which created much interest as well as some excitement, and as we of California were particularly concerned, I paid very close attention to it. It charged Mexico with carelessness, want of attention, and negligence as to infectious and contagious diseases on the Rio Grande, and as an illustration of that statement it was mentioned that there had been in Texas over 1,400 cases of smallpox, and 400 deaths, all clearly and positively chargeable to want of care and gross inattention on part of Mexican authorities. I watched the matter very closely, as a resolution of this Board instructed me on that very subject, making me a party unusually interested. It finally culminated in an international question, and a resolution was adopted recommending a National Commission of equal number of delegates from each Government, to which should be referred the whole matter.

Very interesting and instructive papers were read and fully discussed relating to consumption and diphtheria.

The ignorance of the public as to the origin and nature of consumption, of its communicability, was lamentably noticed.

The fact that more than 100,000 persons die of this disease annually in the United States, and the fact that by its (to a certain degree preventable) communicability this great number of deaths is kept up to so great a figure, shows conclusively that the public mind is not enlightened as it should be by proper authority, and to whom better can this important duty be assigned than to State and local Boards of Health? The carelessness of those afflicted as to where they expectorate, and the inattention of those whose duty it may

be to look after the cleanliness of what they have in charge, caused much animated discussion, and the universal opinion forcibly expressed was, that those most interested in sanitary matters were not doing their entire duty in the matter of instructing the people as to the danger continually menacing them in this one disease.

It was generally conceded that legal enactment should compel railroads and other public carriers to be more careful as to providing receptacles for the expectoration of phthisical patients, and to disinfect those vessels often and thoroughly. In the same session the subject of diphtheria was discussed; all those engaged in the discussion contended that at least for sanitary purposes diphtheria and membranous croup were identical, only differing as to the location of the exudation, and that the same precautionary measures should be adopted in the management of both. One particular fact was mentioned by our Mexican brethren: That previous to the French invasion to favor and assist Maximilian in his aspiration for imperial honors, croup and diphtheria were unknown in Mexico, but since that time there has been much of it and quite fatal in its results. Wednesday being Inauguration Day, and the hall being used for those ceremonies, there was no morning session, the Association, by invitation, being present and attending in a body at National Palace, to offer our congratulations to President Diaz.

The subject of national or local quarantine occupied the attention of very many delegates, the New York and Louisiana delegations contending against what was called by some an invasion of States rights by the General Government and meddling with local affairs. The question was very adroitly handled, so that no collision of sentiments to any dangerous degree took place. I am satisfied that the opinion of the great majority was in favor of the United States Government taking sole and entire charge of all quarantine matters.

At a conference of State Boards of Health held at Nashville, Tenn., three years ago, the delegate of this Board was instructed to present a resolution expressing the sentiment of this Board, that the interest of sanitary science would be better advanced by a meeting of State Boards with the American Public Health Association, and a special section framed for the express purpose of discussing such matters as usually were presented to State Boards. As is well known, that resolution met an ignominious fate, but the wisdom of such a resolution was most beautifully shown at this convention. A time and place were designated for a conference of all representatives of State Boards of Health and those who were connected with quarantine stations. The attendance was large, many State Boards were represented: Canada by delegations from Montreal and Quebec quarantine stations; Ontario, by that veteran sanitarian, Dr. Bryce; New Orleans, by Drs. Mayer and Oliphant; New York, by Dr. Jenkins, and Boston by Dr. Durgan, who is now President of the Association. Dr. Bailey, of Kentucky State Board of Health, was chosen to preside. Dr. Probst, of Ohio State Board, was Secretary. A free and full discussion was entered into by all as to the probability of an invasion of cholera next season, and as to what preventive and protective measures had been made, and what should be made. Your representative gave what he flattered himself to be a very particularly interesting statement of what action this Board had taken, and what it intended to do in relation to, land inspection and formation of quarantine stations. He was very particular as to his description of the station at Angel Island, and did not omit to speak highly of the efficiency of Dr. Lawler, the Quarantine Officer. He assured the Eastern brethren that they need have no fear or uneasiness of any contagious disease coming into this community through the State of California. It was the unanimous opinion that cholera at this time was only dormant, and that as soon as favorable circumstances arise in the coming spring and summer it would fully develop and we be threatened with another invasion, and that it was the great duty of all interested in sanitary work, particularly State and local Boards of Health, to prepare for its reception.

The conference was very interesting as well as instructive, many prominent sanitarians taking part in the discussion. A full and very interesting account was given of the management of the cholera at quarantine stations of New York by Dr. Jenkins, the Health Officer at that point.

Many reports of the gross carelessness and inattention of the Mexican sanitary authorities, as to contagious diseases (possibly much exaggerated), were in circulation among the many visitors to the republic.

Although I was admonished to be on the lookout for smallpox, and was paying strict heed to the admonition, I will say that I did not see any one variolously afflicted.

I did, however, see an unmistakable case of leprosy selling fruit at one of the railroad stations, to passengers on the train; although I had no jurisdiction nor authority for action, I did most strenuously and successfully caution the passengers about buying anything from the poor unfortunate victim.

This Board was duly honored by President Formento, by the appointment of your delegate as one of the Advisory Committee to represent California.

Respectfully submitted.

C. A. RUGGLES, M.D.

Dr. W. G. Cochran read the following report of his action in selecting a site for quarantine purposes near Yuma:

LOS ANGELES, CAL., November 29, 1892.

To the State Board of Health:

The undersigned committee appointed to select a site for a quarantine station near the California line on the Southern Pacific Railroad, Yuma Division, report: November 22d, accompanied by Dr. Price, of Colton (formerly a resident at Yuma), we proceeded to Yuma, where we were met by Dr. Cotter of that place. At an early hour on the morning of the 23d, having been provided with special engine and caboose by the railroad company, we all proceeded westward, and found a new line of road was being constructed westward from the Colorado River to El Rio, six miles west of Yuma. At El Rio, on the bank of the Colorado River, we found a railroad spur, or track, built off south to the river bank, and to an old quartz mill. Immediately adjoining this mill is an adobe building; farther east are four or five more adobe buildings, one of which we found in fairly good repair and well located for hospital purposes, being four hundred feet from what is now the railroad, and six hundred feet east of the track to the old mill. In close proximity to this building is another that could be used for hospital purposes if necessary.

By the railway company leaving four hundred and fifty feet of what is now the traveled road, the same could be used as a switch upon which cars for bathing and fumigating could remain, at a point four hundred feet south of the new line, and four hundred feet north of the hospital.

On the track running to the mill could be left a car with ice and provisions, also sleeping cars for detained passengers. The old mill could be used for shade and dining-room, while the adobe adjoining would answer for a kitchen.

There is plenty of wood corded up in the immediate vicinity.

The above described buildings, and the ground on which they are situated, are the property of a mining company, of which O. F. Townsend, of Yuma, is agent. We saw the agent, and he corresponded with the owners of the property, and writes that he is authorized to lease the same to the State Board of Health, or its representatives, at such rent as can mutually be agreed upon. This is the only place near the California line on the railroad that is at all suitable for quarantine purposes, and while this will be a hot place in hot weather, it is the first place to be found, the adobe buildings described answering for hospital and other purposes, plenty of wood on the ground, and the Colorado River furnishing plenty of water for all purposes. These advantages, together with the extra railroad track all ready for use, warrant us, we feel, in recommending this point as the most suitable to be found for purposes of quarantine.

We further recommend that the proper representative of the Southern Pacific Railway Company be at once seen and asked to allow the necessary railway tracks to remain.

We herewith append a diagram of the railway track and buildings, all of which is respectfully submitted by your committee.

W. G. COCHRAN.
C. A. RUGGLES.

YUMA, ARIZONA, November 28, 1892.

Hon. President State Board of Health, Sacramento, California:

DEAR SIR: I am authorized by the owners of the El Rio property, five miles west of here, to rent the same for a quarantine station, to the State of California, at such rent as your honorable Board, or its representative, and myself, can agree upon, at the proper time.

Very respectfully,

O. F. TOWNSEND,
Agent.

Report received and placed on file.

On resolution by Dr. Ruggles, the Secretary was instructed to issue a circular invitation for a Sanitary Convention to be held in San Francisco, on April 17, 1893, to consider the best means to prevent the introduction of Asiatic cholera within the State during the coming season, and to combat it if introduced; also to consider such other matters as may properly be discussed in sanitary convention.

On motion of Dr. Cochran, Drs. Cluness, Ruggles, and the Secretary were elected as a Committee of Arrangements for such convention.

The following communication was received from Dr. Cochran, in which he tendered his resignation as President of the Board:

GRAND HOTEL, SAN FRANCISCO, CAL.,
February 13, 1893.

To the Members of the State Board of Health of California:

GENTLEMEN: I have accepted a responsible position, that renders it necessary for me to retire from the practice of medicine. The indications are that an unusual amount of work and responsibility will devolve upon the Board the coming summer, and realizing

that I will not be in a position to render the service necessarily devolving upon the President of the Board, I respectfully tender you my resignation as such, to take effect at once.

I desire to express to you my sincere thanks for the honor you conferred on me by electing me your President, and for the courteous consideration I have at all times received at your hands.

Respectfully,

W. G. COCHRAN.

On motion of Dr. Ruggles, the resignation of Dr. Cochran was accepted.

Dr. Cluness placed Dr. Ruggles in nomination for President of the Board, and by consent the Secretary was instructed to cast the ballots for his election. This being done, Dr. C. A. Ruggles was declared duly elected President of the State Board of Health.

Adjourned.

The regular quarterly meeting of the State Board of Health was held at the office of the Secretary, at 1:30 p. m., April 16, 1893.

Present: Drs. C. A. Ruggles, C. W. Nutting, W. F. Wiard, J. H. Davisson, and Winslow Anderson.

Reading of the minutes of the last meeting was dispensed with.

This being the first regular session since the appointment of the Board by the Governor, the members presented their commissions, which were declared to be in due form.

The President stated the first business to be the election of a President and of a permanent Secretary.

Dr. Winslow Anderson nominated Dr. C. A. Ruggles for President, and he was declared duly elected President of the Board for the ensuing year.

Dr. C. W. Nutting placed Dr. J. R. Laine in nomination for permanent Secretary for the term for which he was appointed, and he was unanimously elected.

Drs. Ruggles and Laine reported having received communications from people at Yuma, A. T., protesting against the location of a quarantine station at El Rio, on the California side of the Colorado River; also, a letter from the Attorney-General, calling attention to the fact that the location of a station at that point would conflict with a Federal law, which prohibits such stations being placed within five miles of an Indian reservation. It was deemed advisable for the President and Secretary to proceed to Yuma, to remove the objections, if possible, and to obtain such information as would enable the Board to formulate plans for the future. Upon arriving at that point it was found that a canal company contemplated putting a canal through at El Rio, and expected to locate their buildings on the site selected for a quarantine station. This company is represented by Attorney-General Hart, as their attorney, who, as the legal adviser of this Board, advised us to locate farther away. The point advised by the people of Yuma is 16 miles west of Yuma, on the inhospitable desert, where there is no shelter, no water, nor a blade of grass. On this dreary desert it is urged that cholera-infected trains be stopped and cleansed. This plan presented no insuperable difficulties, except the inhumanity of detaining people in such a forbidding country, where water must be purchased by the carload, and all the necessities of life brought from Yuma by rail.

An effort was made to purchase water from a man by the name of Blaisdell, who had a pipe a few miles west of El Rio, but he would not

sell water for that purpose, and stated he intended taking up the pipe. The question was raised to locate the station on the Arizona side, and obtain water from a pipe owned by Mr. Blaisdell in that direction. He refused to sell water for that purpose. The citizens of Yuma were represented as being strongly opposed to such a station on the Arizona side of the river. In view, therefore, of the hardships to which passengers would be subject by even a short detention on the desert west of Yuma, we have determined to report against the location of a station on the desert, and would advise the stoppage of all persons sick with cholera, or suspected of having that disease, or liable to develop it soon by reason of recent infection, at the State line; and that entrance of all such persons into the State be denied until the Medical Inspector of the Board declare them to be no longer capable of carrying the infection.

The report was received and placed on file, and the recommendations adopted.

Dr. J. H. Davisson moved that all cholera patients and suspects coming to California, via Arizona, be stopped at the State line, and that the Secretary be instructed to communicate with Surgeon-General Walter Wyman, asking the United States Hospital Marine Service to take charge of quarantine matters at those points.

This motion was adopted; also another, instructing the Secretary to establish a station on the west side of the desert, at or near Banning, in case the Government should consent to assume charge at Yuma.

The Secretary applied for and was granted a three months' leave of absence from May 15th, with permission to leave the State, and on motion of Dr. C. W. Nutting, was instructed to continue the assistance of Dr. Elster until May 15th, and to obtain the necessary assistance and a substitute during his absence, at a compensation not greater than that received by him, to be paid out of the contagious disease fund.

The Secretary was instructed to pay all bills to be incurred in the holding of the Sanitary Convention at San Francisco, April 16th, and to employ a stenographer for the convention.

On motion of Dr. Anderson, it was resolved to adjourn from day to day, so as to visit San Quentin Prison, the Napa Asylum for the Insane, the Home for Feeble-Minded near Glen Ellen, and the State University and Home for the Deaf, Dumb, and Blind, at Berkeley.

The Board then adjourned until the following day.

APRIL 17, 1893.

The Board met in regular adjourned session to meet as a State Sanitary Convention at B'nai B'rith Hall, San Francisco, at 1:30 P. M.

All the members present, except Dr. P. C. Remondino.

The proceedings being lengthy, it was determined not to place them on the minutes, but to have them printed, the Secretary being instructed to have a sufficient number of copies printed and bound in pamphlet form.

Adjourned to meet at San Quentin the next day.

APRIL 18, 1893.

The Board met in regular adjourned session at San Quentin Prison. All the members present, except Dr. Remondino.

It was found that all the recommendations made by the Board at its last meeting had been put into force. The sanitary condition of the prison was as good as it could be made, with the existing conditions of an old site and ancient buildings. There was everywhere an air of neatness, and evidences of economy in management.

Adjourned until the next day to meet at Napa Insane Asylum.

APRIL 19, 1893.

Regular adjourned meeting of the Board. All the members present, except Dr. Remondino.

The Board proceeded to Napa, and visited the asylum, where it was found that all the recommendations made by the Board at its last visit had been carried into effect, so far as the Superintendent had authority, and that appropriations had been asked for and partly obtained by the Directors to complete the remainder. The institution was found in an excellent sanitary condition, and was declared to be, by the individual members of the Board, a credit to the State—not only in the buildings alone, but in its management. No recommendations were made.

Adjourned until the next day, to meet at the Glen Ellen Home for Feeble-Minded.

APRIL 20, 1893.

The Board met in regular adjourned session at Glen Ellen Home for Feeble-Minded. This institution has large grounds, with orchards and vineyards, and an ample water supply from a large spring some distance above the buildings, and piped into them.

There was every evidence of careful attention on the part of the management toward the defectives who are inmates of the home. The food and bedding are good, and the rooms were kept neat and the children clean. No adverse criticism was made with reference to the care of inmates, but the buildings received a full and well-merited condemnation.

No effort had been made to level the grounds around the buildings, and water had been permitted to run under the buildings, which could have been conducted away by a few hours' work with a shovel. The concrete floors, on the ground floor of the buildings, were everywhere badly sagged, and frequently cracked. This was said to be due to the settling by reason of water running under the buildings.

The floors above were of fourth-rate lumber, and totally unfit for the purpose. The plaster on the walls is so frail that the children have picked it off, it crumbling easily, leaving the laths bare and unsightly in places all around the dormitories and hall; also in the water-closets, where the patches are covered with rough boards. The water-closets are insufficient. There are in one ward two closets to accommodate seventy-four girls. There are no transoms over the doors into the halls, and these long halls are lighted by a window at each end. This is deemed insufficient, as there should be at least two or three skylights, for light and ventilation of the halls. One floor is so bad, having evidently been

laid green and of bad lumber, that putty has been used to fill the cracks. On the second story of what is known as the "Madrona Hall," is a room eighteen by twenty-four feet, containing two large wooden tanks. These should be placed outside of the building, if retained at all, and the room utilized as a dormitory, or for another purpose than housing tanks.

The dormitories, halls, and closets should be wainscoted without delay with good and durable material, and the water-closets increased everywhere, suitable to the requirements of the inmates. It is understood that an addition, or wing, is soon to be constructed, before the building is completed. Before the work is entered upon the plan should be submitted to competent authority, and before being accepted by the State should be inspected by the State Board of Health or other competent authority. To continue such work as has been done at Glen Ellen, will constitute an offense of greater magnitude than a mere scandal.

The Board adjourned to meet at Berkeley the following day.

APRIL 21, 1893.

The Board met in regular adjourned session at the State University at Berkeley. All the members were present, except Dr. Remondino.

The sanitary condition of all the buildings was found good. The water supply was reported as being insufficient during a portion of the year, but the requisite quantity was obtained elsewhere. The different departments were inspected under the agreeable escort of President Kellogg, and everywhere elicited the commendation of the Board.

The Asylum for the Deaf, Dumb, and Blind was next visited; but as this institution is noted for the perfection of its general appointments, nothing but favorable criticism could apply to its sanitary condition.

The Board then adjourned until July, or at the call of the President.

The regular quarterly session of the State Board of Health was held at the office of the Secretary, July 17, 1893, at 8:30 p. m.

Present: C. A. Ruggles (President), Drs. W. F. Wiard of Sacramento, Winslow Anderson of San Francisco, and Dr. L. A. Elster, acting Secretary pro tem.

On motion, the reading of minutes was omitted.

Dr. Anderson presented an outline of a paper prepared by him, giving simple and positive tests for water for drinking and culinary uses.

The President asked Dr. Wiard to take the chair.

Dr. Ruggles moved that the Secretary have ten thousand copies of the circular embodying Dr. Anderson's paper printed for distribution through usual channels. Motion carried without dissent.

The following correspondence was presented, as having been had in pursuance of instructions by the Board at the April session:

SACRAMENTO, April 24, 1893.

WALTER WYMAN, *Surgeon-General Marine Hospital Service, Washington, D. C.:*

SIR: I am instructed by the State Board of Health to ascertain what decision has been made with reference to governmental control of land quarantine between Territories and States. California deems it necessary, in the event of the landing of cholera on this continent, to make an attempt to stop it at the State line. There are four points where this should be done, and I will name them in the order of their importance:

Yuma, on the Colorado River, at crossing of the Southern Pacific Railroad; Needles, or the point of crossing of the Atlantic and Pacific Railroad. At both these points the State Board of Health have determined to prevent persons afflicted with cholera, or who have been so recently in contact with the disease as to merit the term of "suspects," from crossing the State line into California.

The necessity for such action is emphasized by the action of the people of Yuma, who have refused to permit us to establish a station at El Rio, on the west bank of the Colorado, or to allow us water from a pipe farther west, or to permit us to establish a station on the Arizona side. This gives us the alternative of stopping trains on the terrible desert west of Yuma, where there is neither water, wood, nor shelter, and to care for passengers and sick at an improvised camp in this inhospitable region, or stop all infected persons and cars at the State line, and let the Territory or the Federal Government assume the responsibility and expense of their care. Considerations of humanity lead us to choose the latter course, as nothing but the most extreme necessity would justify us in stopping passengers on the inhospitable Colorado desert.

We wish to know, therefore, if you will take charge at Yuma and Needles, and if we may depend on the Government covering these two points fully. In the event of your doing so, we will establish stations west of those points, and maintain them, so as to care for those who might pass the points in your charge, or develop the disease later, and with the exception of an Inspector, who would travel into Arizona daily, we would in nowise interfere, unless the work should be done in so lax a manner as to justify our fear. This is scarcely probable, and is not supported by the past history of the M. H. S.

I append herewith the law of the State concerning contagious diseases, and will add that under the general police laws of the State we have the right to go outside of the State, if necessary, provided we have the consent of those in authority.

The remaining points to be protected are the Nevada State line near Truckee, and the Oregon State line in the north. These points the health authorities of California will care for, and ask no aid from the Government. But the former, owing to their proximity to Mexico, and the distance across a sparsely settled country, offers in addition to the apparent hostility of the citizens, serious difficulties in the way of an effective land quarantine of our State.

Very respectfully,

J. R. LAINE, M.D.,
Secretary State Board of Health.

In reference to above communication, Dr. Wyman wrote as follows:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL }
MARINE HOSPITAL SERVICE, WASHINGTON, D. C., May 10, 1893. }

J. R. LAINE, M.D., *Secretary State Board of Health, Sacramento, Cal.:*

SIR: I am in receipt of your letter of the 24th ultimo, with regard to the protection of the State of California from the introduction of contagious disease through the Arizona border, namely, at Yuma and The Needles.

In reply thereto, I have respectfully to state that there is a Marine Hospital officer on duty at Brownsville, Texas; that sanitary inspectors of the Marine Hospital Service are stationed at Laredo, Eagle Pass, and El Paso. These inspectors have been placed on duty with special reference to the introduction of typhus fever and smallpox, but should cholera be reported anywhere in Mexico, another inspector would be immediately appointed at Nogales. When this is done, all points of entrance into the United States from the Mexican border will have been covered, and it would seem as though the border line between Arizona and California would be protected by this line of inspectors. A special inspector will be placed on duty at Nogales at any time that a telegraphic request from you is received.

Respectfully yours,

WALTER WYMAN,
Supervising Surgeon-General, M. H. S.

Dr. Ruggles reported that in accordance with a suggestion by the General Manager of the Southern Pacific Railroad, Mr. A. N. Towne, he went to Yuma, Arizona, to confer with Dr. Goodfellow, of Tucson, who has been appointed Territorial Quarantine Health Officer. He was accompanied to Yuma by Dr. J. H. Davisson, of Los Angeles, member of this Board, and by Dr. M. F. Price, Health Officer of Colton.

In the conference it was agreed that in case of danger of introduction of cholera on that line a quarantine station should be established at or near Cabazon.

On motion of Dr. Anderson, the action of the President in this matter was fully indorsed by the Board.

On motion of Dr. Anderson, it was ordered that whenever the President of this Board is convinced that cholera has appeared anywhere on the land of the United States, the State of California shall be at once quarantined against it.

Dr. Ruggles resumed the chair.

A petition was presented asking the Board to appoint H. B. Marshall, of Los Angeles, State Inspector of Contagious Diseases among Animals.

After informal discussion it was ordered that at the present time it does not seem necessary to quarantine against any State or country, and the petition was placed on file.

OCTOBER 24, 1893.

Board met in regular session at Sacramento at 8 P. M.

Present: Drs. C. A. Ruggles, Winslow Anderson, W. F. Wiard, and J. R. Laine.

The minutes of the previous meeting were read and approved.

The Secretary was instructed to send invitations to sanitarians and medical men to prepare papers for the Sanitary Convention of 1894, and to issue a general invitation to attend, and was authorized to obtain the necessary assistance with which to carry out these instructions.

Dr. Wiard gave notice that he would at the next regular meeting introduce a resolution that the Board take action in an attempt to limit the spread of pulmonary consumption.

The Board then adjourned.

The Board met in regular quarterly session at the office of the Secretary at 7:30 o'clock P. M., January 15, 1894.

Present: Drs. Ruggles, Wiard, and Laine.

Letters were read from Drs. Davisson, Remondino, Nutting, and Anderson, stating good and valid reasons why they could not be present.

The Secretary was instructed to prepare and have printed a circular on school hygiene for the instruction of public school teachers. He was also authorized to procure the necessary assistance to arrange for the Sanitary Convention in April.

The Board resolved to urge all local Boards to exercise sanitary and hygienic control of school-houses and other public buildings.

Drs. Ruggles, Davisson, and Remondino were appointed to proceed to an inspection of Whittier School, San Bernardino Asylum, the United States quarantine station at San Diego, and the Normal School at Los Angeles, and make a report thereon.

The Board then adjourned, to meet at the call of the President.

The Board met in special session at the office of the Secretary at 3 P. M. March 12, 1894, at the request of the Secretary.

Present: President Ruggles, Drs. Wiard and Laine.

The purpose of the meeting was to perfect some plans to limit the epidemic of diphtheria on the Yolo side of the Sacramento River, below Sacramento.

The matter was left to the discretion of the Secretary, and the Board adjourned.

Regular meeting State Board of Health, held April 13, 1894, at the office of the Secretary.

Present: President Ruggles, Drs. Nutting, Wiard, and Laine.

Letters from Drs. Davisson and Anderson were read, showing inability to be present.

The Secretary reported having caused to be published a pamphlet on "School Hygiene for Public School Teachers," as directed by the Board at the January meeting, also that he had caused to be printed registers of births, marriages, and deaths, which the Secretary of State was distributing to the various County Auditors in the State. He reported also a large volume of correspondence with the different County Auditors and Clerks, who, in most instances, explained the neglect of registration to the apathy and indifference of the physicians.

The Secretary reported having completed a programme for the Second Annual Sanitary Convention, to be held at San José, April 16th, and that all arrangements had been made for the holding of the same on the date fixed.

Dr. Wiard presented his paper on the contagiousness of tuberculosis, which the Board approved.

On motion, the action of the Secretary in carrying out the various instructions of the Board as reported, was approved.

The Board then adjourned to meet at San José at 1:30 p. m., April 16th, and to adjourn from day to day until the work of the Board is completed.

The Board met in regular session at Germania Hall, San José, at 1:30 p. m., April 16th.

Present: Drs. Ruggles, Nutting, Wiard, Davisson, Anderson, and Laine, in attendance on the second annual Sanitary Convention.

A large number of attendants were present, and the convention continued in session until midnight, when an adjournment was had until 9 a. m., April 17th.

The Board met in adjourned session at 9 a. m., April 17th.

Present: Drs. Ruggles, Nutting, Davisson, Wiard, Laine, and Anderson.

A sanitary survey of the State Normal School at San José was then made, but its general sanitary condition was such that no recommendations were deemed necessary, and its condition was formally approved.

The Board then adjourned to meet at San Francisco, in order to proceed from there to an inspection of the Mendocino Asylum at Ukiah.

The Board met at San Francisco, on April 18, 1894.

Present: Drs. Ruggles, Nutting, Anderson, Davisson, Wiard, and Laine.

Drs. Ruggles, Davisson, Wiard, and Laine were instructed to proceed to an inspection of the Mendocino Asylum, and of the Clear Lake region in Lake County, and report, first, on the condition of the drainage at the asylum, and second, on the physical conditions of the Clear Lake regions with reference to its use as a summer resort and public sanitarium.

Dr. Nutting was appointed a committee to note all matters relating to public health that would arise in the progress of the transactions of the State Medical Society at San José.

Dr. Anderson was appointed to edit the transactions of the State Sanitary Convention.

Drs. Ruggles, Davisson, Wiard, and Laine then proceeded to Ukiah and inspected the Mendocino Asylum.

The conditions of the asylum, so far as the management is concerned, are in many ways commendable.

The buildings, though incomplete, are ample for the number of patients maintained at this time. The wards, kitchens, dining-rooms, laundry, bakery, and grounds are clean. The food supplies are of excellent quality, the vegetables are fresh, and the butter is sweet. The storehouse is stocked with supplies of good quality.

The scullery should have a door cut down where the only window now is, to the floor, so that the garbage may be removed. A glass or screen door should be provided so that light may be obtained. A garbage cart with low wheels and a galvanized iron bed should be obtained for the easy and quick disposal of garbage from the scullery. At present the sole mode of egress and disposal is through a window facing south, where flies will be attracted in summer. A dark inclosure for the cart a few feet distant would, in a degree, remove the offense, but a galvanized iron cart body with lids for cover, and made to dump, will fill all necessities. This, if hosed down before return to the scullery, will remove all objection. At present all garbage is put into a barrel, which is lifted and wheeled away when full.

The car track in the basement should be continued eastward to the bakery and laundry, by cutting a way through the terrace to the basement of this combined building as bakery and laundry. This would make quick and easy transit between all parts of the asylum and the laundry, and from the bakery to the kitchen. Now all laundry material is brought by car to near the end of the building, where it is transferred to baskets and carried by hand to the laundry, and returned in the same way. The bread is also hauled in baskets instead of by car.

There should be an intercepting tiled drain sunk at the foot of the terrace from south to north, the entire length of the buildings now on the ground and of those contemplated, down to a depth corresponding to the foundation of the brick walls of the buildings. This would carry off the water that in the rainy season wells up from a stratum of quicksand that shows up at the south extremity of the terrace, making the roadway impassably miry, and threatens to dampen the floor of the basement by passing under the foundation walls of the buildings. This may be done at an expense much out of proportion to the benefit to be derived.

The disposition of the sewage of the asylum is a question of first importance. At present the method employed is of a temporary character, which may cause complaint if continued during warm weather.

The situation is, in the opinion of the Board, favorable for an inoffensive and efficient utilization of all the sewage from the asylum. This may be done by extending the 10-inch sewer from the northeast corner of the building grounds northerly to as high ground as it can be carried by natural fall, in the field lying north of the asylum buildings. At this point, which should be the highest ground capable of being reached, settling-tanks should be set in the ground, and the water drained off for

irrigation of the lands below. There is sufficient land suitable for irrigation purposes below the point where the tanks should be situated, to fully utilize all the water flowing from the tank, with no offense to the sight or smell of the inmates of the asylum, or to the people living in the vicinity. But the tanks and drains should, as far as practicable, be under ground to the point where the water leaves the drain for irrigation purposes. The solids may be shoveled out of the tanks and mixed with earth to form a valuable fertilizer. No chemicals should be used. This will be an economical and effective means of disposal of waste, and will equal in efficiency the best of any public institution in the State. But it should not be undertaken until a survey of the ground shall first be made, in order to ascertain the highest possible point for the location of the settling-tanks.

When the additional ward on the south side is built, the sewage from that division of the asylum may be conveyed southerly to a convenient and desirable point, and be treated and disposed of on the land in that direction. We believe this method will prove practicable and valuable.

The Board then proceeded by a private conveyance to Lakeport, in Lake County, by way of the Blue Lakes.

April 20th was spent in noting some of the natural conditions that have given this remarkable locality a common report favorable to health. Lake County takes its name from a broad lake of clear water resting in a great basin of mountains lightly fringed with timber. The stay of the Board was too brief to more than note a few of its chief and minor attractions. There lies to the northwest of the lake a fertile valley, which formed a part of the lake bottom at a period when its waters were higher than now. The land is deep loam, and grows enormous oaks to a towering height. There is also on the west side of the lake another stretch of level valley in the vicinity of Kelseyville, which is but a little above the level of the lake, and is a region of exceeding fertility. There are numerous spots of a few hundreds of acres of level land, but none of any considerable extent but these in Lake County, except in the region about Middletown, south of and removed from the lake. The lake is about 1,200 feet above the level of the sea. To reach it mountains have to be crossed at an elevation of 4,000 feet. The lake is clear, deep water, abounding with fishes. It is not uncommon to see large fishes swimming in the clear depths as the boat glides over the bosom of the water. It is irregular in outline, twenty-five miles in length, and eight miles at its widest part on a line from Lakeport easterly to Bartlett Springs landing.

The east side is steep, sloping quickly down to the margin of the lake, with a few hundred acres of flat land indented at intervals in the base of the mountain, where rich orchards thrive, and are mirrored on the placid waters in an accuracy of outline as sharply cut as if done in cameo. The mountains are also clearly reflected on so grand a scale as to startle the unaccustomed gazer. The west side of the widest part of the lake is crowned with a wooded ridge, upon which is admirably situated the town of Lakeport. Suddenly, the lake margin is flat tulle to the base of a towering volcano mountain, which rises something above 4,000 feet. This is commonly known as "Uncle Sam," and bars the lake abruptly on the south, forming, by projecting points of land, a bay on the northern base of the mountain. This is Soda Bay, where one eighth of a mile from shore, at the foot of a precipitous steep, there rises from

the midst of a mass of partly submerged igneous rocks, bubbling with gases, an enormous spring of warm mineral water, boiling from two to three feet above the surface of the lake. The water is sharp and quite agreeable to the taste, and is said to greatly resemble in its cleansing and refreshing qualities as a bath the waters of the famous springs near Ukiah. The waters of the springs at Ukiah are, for purposes of the bath, unrivaled in the world. This unqualified statement can only be appreciated and understood after trial.

The waters of the great spring in Soda Bay possess gaseous qualities, which is so marked a feature in the waters of the Ukiah Springs: that of forming small bubbles adherent to the skin of the body, almost enough to float it, creating a sensation metaphorically and not inaptly compared to a champagne bath—if any one knows what that is. The springs are situated over and contiguous to a mass of rocks, which might prove a sufficient foundation for suitable hotel and bath purposes, which accommodations will certainly be needed if the facilities for reaching this region should be improved.

The shore line trends abruptly to the east from this point to a narrow part of the lake, when it turns again to the south, where islands and points of land come to view projecting into the water from the main shore, making a scene of uncommon beauty. The time was too limited to survey the southernmost extremities of the lake.

There are climatic peculiarities which make this locality the most promising summer resort in California. During the morning and forenoon the wind blows from the east, across the mountains from the direction of the Sacramento Valley; during the afternoon and night the breeze is from the ocean—a distance in an air line of about seventy to eighty miles. In coming from the sea it first encounters a high coast range, the Mendocino Mountains, where it is deprived of its fogs and other irritating qualities; then it crosses the Russian River Valley, receiving warmth; then it rises over the range that intervenes between the Russian River Valley and Clear Lake, and which forms the westerly rim of the lake basin, which deprives it of any remaining humidity, so that when it falls into the Clear Lake basin, or valley, it is cool, dry, and refreshing, having lost in its passage the harsh neuralgia-breeding qualities of the coast breeze.

To those who live in the Sacramento and San Joaquin Valleys, the harshness of the coast wind is not infrequently a dangerous shock. A slightly higher altitude with a modified coast breeze is much better borne. Then again, the dweller in the cities need a summer climate free from miasm and mild enough to permit of wearing summer clothes. The one feature of prime value is the total absence of fog in winter and in summer. To many persons this is a climatic feature of no little importance, since the sunshine is an almost imperative necessity to their comfort and a mildly tonic air to their existence.

It is an agricultural region in the midst of charming mountain and lake scenery, of sufficient breadth and expanse not to tire the eye. The apple, pear, peach, apricot, fig, and orange grow in profusion, while the smaller fruits are produced in quantities. Enough is raised here to sustain a teeming population.

On the north shore of the lake were seen a few Indian huts, the remnants of the numerous savages that once inhabited this valley, living on

game and fish. A solitary dugout canoe, with two Indian fishermen, were all that were seen on this day.

The presence of numerous very valuable mineral springs in the vicinity of the lake, makes this magnificent sheet of water of necessity a central feature.

Highland Springs, with an almost inconceivable variety of mineral waters of incontestable virtues, are six miles west or southwest of Lakeport, on the stage road to Pieta. Great pains seem to have been taken by the management of the springs to insure the welfare and comfort of its numerous guests. Saratoga Springs, farther north, is a popular resort, while summer houses are opened on the Blue Lakes, to the northwest. The well-known Bartlett Springs lie twelve miles east of the lake at an elevation of 1,000 or more feet above the lake, while in the same vicinity are many others, which, while not enjoying the same degree of popularity, are believed, by their visitors, to possess great healing powers.

South and southwest from the lake are a great number of mineral springs, having a great variety of waters.

Perhaps in no equal geographical area in the known world is there an equal variety. But the visit to any of them, and to the Lake region, is a matter of great bodily endurance and physical discomfort. No matter from what direction, the approach must be by wagon or stage. The shortest route by stage from railroad is from Pieta, on the S. F. and N. P. R. R., to Lakeport, a five hours' ride up a good road of twenty miles on a 12 per cent grade, or twelve feet in the hundred feet. It is, however, the best road into the valley, and also the quickest from rail. If an entrance by rail could be effected into this unrivaled region, many pretty villas and summer houses would be erected on the margins of the beautiful lake, and few tourists would fail to visit the famed region and ride over the placid bosom of the water in the swift launches that are destined to play no subordinate part in the future pleasures of this spot.

A ride in a modern naphtha or electric launch, near the margins of this lake, is one of the pleasing experiences of life that is likely to be treasured in the recollection, to be involuntarily recalled from time to time, making one yearn to go back to an air that soothes and lulls the senses to a feeling of rest and restores rapidly the vigor of body and of mind.

The shores are in many places sand or gravel, shelving down into the water, making choice bathing places for pleasure seekers. Clumps of willows near the shore make an inviting shade. Malarial poison is a stranger to this region. This lake has no rival in California. Tahoe has a capricious climate, arctic in winter and sterile in summer. The Clear Lake region has a most charming summer and winter climate, with fertile surroundings. If it were placed within four or five hours by rail from San Francisco, it would at once and forever outrank all other summer resorts in the State, and maintain, through its superior natural attractions and advantages, its lead of any and all competitors, one may safely say, in the world. The entire region may be termed a natural sanitarium.

The Board returned to San Francisco. The Secretary was authorized to employ a typewriter to copy minutes and manuscript, and then adjourned to meet at the call of the President in June.

The Board met in special session, June 3d at 4 p. m.

Present: Drs. Ruggles, Wiard, Davisson, and Laine.

It being Sunday, no business was transacted, and the Board adjourned to meet at Folsom Prison on the following day.

JUNE 4, 1894.

The Board, composed of Drs. Ruggles, Davisson, Wiard, and Laine, visited the Folsom State Prison and inspected the prison grounds, kitchen, sewers, and general condition.

The sanitary condition of the prison was such as to meet the unqualified approval of the Board. Ventilation is perfect. The fall for drainage is sufficient. There is a new closet with 27 holes to be used by 700 people. These are set over a concrete trough, occupying three sides of a square inclosed with a fence only. The trough may be flushed as often as desired with an enormous volume of water. The floor is concrete also. The lavatory is supplied with an abundance of water, while a room 15x20 feet square, with concrete floor, is arranged for hot and cold shower baths. This does away with tubs, and is an effective and original plan devised by the Warden. The kitchens were in good condition, and the supplies in the store-room of good quality.

A new dining-room and kitchen is in contemplation. There is room and abundant material with which to construct additional accommodations for prisoners, and should be done, and the old prison at San Quentin abandoned. The matter of economical management is not for the consideration of the Board, but an abundance of water and water power, with building materials unlimited, will furnish out-of-door labor for many men, and are considerations of too great interest to the State to pass silently by. The two prisons might be consolidated to great advantage. Economy of administration alone would be reason enough, but putting aside such a consideration, and looking to the physical, mental, and moral influence, on prisoners only, of out-of-door work and sunshine, and the reasons are sufficient. A hard-handed, sun-burned man will find no trouble about getting work to do; but it is not so with the unfortunate prisoner whose hands are soft, whose muscles are flabby from long disuse, and whose pallor is a tell-tale of recent confinement.

JUNE 5, 1894.

The Board met in adjourned session at the room of the Section on State Medicine of the American Medical Association.

Present: Drs. Ruggles, Anderson, Nutting, Wiard, Davisson, and Laine.

The members participated in the proceedings and adjourned until the next day.

JUNE 6, 1894.

The Board again participated in the work of the Section on State Medicine.

All the members present except Dr. Remondino

JUNE 7, 1894.

The Board, composed of the same members as on the day previous, continued its work in the Section on State Medicine.

JUNE 8, 1894.

The Board proceeded to an inspection of the San Quentin Prison.

While the management is undoubtedly good, the supplies of excellent quality, the grounds and prison kept in a cleanly condition, yet the place is redolent of age and decay.

Everything about the place is an argument in favor of a new prison and an abandonment of the old. It cannot be conducted with economy. The water is acquired by purchase. Coal is purchased to create power for the jute mills, while water-power goes to waste at Folsom.

A moderate enlargement of accommodations at Folsom would render possible a consolidation of the two prisons under one management, and permit of the employment of nearly all of the men out of doors. This would keep them in a rugged condition, which would enable them to obtain out-of-door work upon the expiration of their terms.

The Board then met at the residence of Dr. Winslow Anderson. Dr. Ruggles reported having made examinations of diseased cattle at Stockton, and of having verified the disease by killing.

The following resolution, introduced by Dr. Davisson, was unanimously adopted:

Resolved, That the action of Dr. C. A. Ruggles in the inspection and killing of diseased cattle at Stockton be commended, and his course be declared worthy of imitation by other health officers in California.

Adjourned.

MONTHLY REVIEW OF DEATHS AND PREVAILING DISEASES.

Reported to the State Board of Health from July, 1892, to July, 1894.

[Reprinted from Monthly Circular of State Board of Health.]

JULY, 1892.

Mortality reports from 98 cities, towns, villages, and sanitary districts, having an aggregate population of 783,003, give 1,091 deaths from all causes during July. This corresponds to a death-rate of 1.39 per month, or 16.69 per annum.

There were 129 deaths due to consumption, 47 to pneumonia, 26 to bronchitis, 13 to congestion of the lungs, 24 to diarrhoea and dysentery, 53 to cholera infantum, 46 to other diseases of the stomach and bowels, 20 to diphtheria, 5 to croup, 9 to scarlatina, 1 to measles, 16 to whooping-cough, 28 to typhoid fever, 7 to malarial fevers, 6 to cerebro-spinal fever, 31 to cancer, 1 to erysipelas, 79 to diseases of the heart, 6 to alcoholism, and 544 to all other causes.

PREVAILING DISEASES.

Reports of prevailing diseases from 63 towns and districts outside of the larger cities show 11 cases of pneumonia, 76 of bronchitis, 4 of pleuritis, 1 of congestion of the lungs, 264 of diarrhoea, 58 of dysentery, 60 of cholera morbus, 50 of cholera infantum, 18 of inflammation of the bowels, 8 of diphtheria, 8 of scarlatina, 14 of measles, 32 of whooping-cough, 31 of la grippe, 29 of typhoid fever, 218 of malarial fevers, 3 of cerebro-spinal fever, 14 of erysipelas, 68 of rheumatism, 69 of neuralgia, 82 of tonsillitis, 7 of pharyngitis, 5 of inflammation of the brain, 1 of chickenpox, and 12 of inflammation of the kidneys.

Abstract of the Reports of Deaths and their Causes in the following Cities and Towns of California during July, 1892.

Other Causes	3	1	—	—	11	—	2	9	2	3	1	5	1	6	1	—	4	4
Alcoholism	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Heart Diseases	2	—	—	—	1	—	—	1	—	1	—	—	—	2	—	—	1	—
Erysipelas	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cancer	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cerebro - Spinal Fevers	—	—	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—
Remittent and Intermittent Fevers	1	1	—	—	—	—	—	1	—	—	—	—	1	—	—	—	—	—
Typhoid Fever	1	—	—	—	—	—	1	2	—	1	—	—	—	2	1	—	1	—
Typho - Malarial Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Whooping-Cough	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Measles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Scarlet Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
Croup	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Diphtheria	—	—	—	—	1	—	—	1	—	—	—	—	—	—	—	—	—	—
Other Diseases of St'mach & Bow'ls	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cholera Infantum	1	—	—	1	—	2	—	1	—	—	—	—	—	—	—	—	—	—
Diarrhœa and Dysentery	—	—	—	—	—	—	—	2	1	—	—	—	—	—	—	—	—	—
Congestion of the Lungs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Acute Bronchitis	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—
Acute Pneumonia	—	—	—	—	1	—	—	—	—	—	1	—	1	—	—	—	—	—
Consumption	2	—	1	—	1	—	1	1	—	1	—	—	—	2	—	—	—	—
Total Deaths	0	12	1	4	1	16	0	18	0	6	3	2	0	13	1	1	7	4
Estimated Population	512	12,300	600	5,000	3,000	1,601	2,000	1,500	1,000	2,500	400	200	10,000	1,900	700	7,000	350	700
	Alturas	Alameda	Alvarado and vicinity	Anaheim and vicinity	Antioch and vicinity	Anderson	Auburn	Azusa and vicinity	Berkeley	Calico	Calistoga	Carpenteria	Colton and vicinity	Chiles Valley	Chico and vicinity	Davisville	Downieville and vicinity	Downey and vicinity
	Etna Mills	El Monte and vicinity	Elk Grove	Eureka and vicinity	Elsinore	Fort Bidwell	Fresno Flats	Fresno	Folsom	Galt	Grass Valley and vicinity	Gonzales	Gridley	Haywards and vicinity	Healdsburg and vicinity			

[illegible]

AUGUST, 1892.

Mortality reports from 116 cities, towns, villages, and sanitary districts, having an aggregate population of 816,793, give 1,014 deaths from all causes during August. This corresponds to a death-rate of 1.24 per month, or 14.88 per annum.

There were 120 deaths due to consumption, 39 to pneumonia, 18 to bronchitis, 5 to congestion of the lungs, 22 to diarrhoea and dysentery, 47 to cholera infantum, 51 to other diseases of the stomach and bowels, 31 to diphtheria, 8 to croup, 12 to scarlatina, 2 to measles, 8 to whooping-cough, 36 to typhoid fever, 1 to remittent and intermittent fevers, 12 to cerebro-spinal fever, 47 to cancer, 4 to erysipelas, 95 to heart disease, 8 to alcoholism, and 448 to all other causes.

PREVAILING DISEASES.

Reports of prevailing diseases from 67 towns and districts outside of the larger cities show 9 cases of pneumonia, 53 of bronchitis, 13 of pleurisy, 2 of congestion of the lungs, 312 of diarrhoea, 60 of dysentery, 90 of cholera morbus, 72 of cholera infantum, 23 of diphtheria, 3 of croup, 23 of scarlatina, 13 of measles, 5 of smallpox, 25 of influenza, 51 of typhoid fever, 332 of malarial fevers, 5 of cerebro-spinal fever, 26 of erysipelas, 84 of rheumatism, 91 of neuralgia, 76 of tonsillitis, 11 of pharyngitis, 5 of mumps, 23 of inflammation of the bowels, and 10 of inflammation of the kidneys.

Measles prevailed at San Mateo, Hollister, Long Beach, and San Pedro. Whooping-cough was reported from Calistoga, Downey, Santa Monica, Fresno, Fresno Flats, San Mateo, Merced, and a few unimportant places, and was epidemic at Ventura, Hollister, and Santa Barbara. La grippe was observed in a number of localities.

SMALLPOX.—Five cases of smallpox were reported from National City, the contagion having come from Mexico by sea. Isolation and strict segregation with vaccination of all exposed persons were the means employed, which has completely prevented its spread.

August was what might be termed a healthy month. Diarrhoea prevailed to some extent, but bowel complaints are common during months when fruit ripens.

It is more difficult, however, to account for the number of cases of rheumatism, neuralgia, and tonsillitis, most of them reported from the driest portions of the State, unless the habit of sleeping out of doors during the warm weather may account for them. Otherwise, they would scarcely be expected in August.

ASIATIC CHOLERA.

As was announced in the June number, the cholera has effected a lodgment in Europe, and is punishing Hamburg for its sanitary sins.

Already in a dozen ships crowded with passengers it is pleading, urging, and threatening to land on our shores, and it seems almost impossible to maintain the rigid vigilance necessary to effectually exclude the unwelcome visitant. The situation is a serious one, and without wishing to criticise, we are led to wonder why the infected ships have not been sent back to Hamburg instead of being held in quarantine in New York harbor. Without a knowledge of international law governing in such matters, it would seem the easier way out of the dilemma, and would be more humane than keeping the well passengers cooped up with the infected ones in an infected ship. Their chances would be better even in Hamburg, where, at the worst, they could be detained on shipboard the same as here. But the protection of our own State is likely to require all the sanitary skill available. San Francisco harbor is protected by ample and well-equipped quarantine facilities, but San Diego has a site and an inspector only, with no disinfection apparatus. Shelter can be easily improvised if necessary, but an improved system of fumigation is not so hastily constructed. The quarantine station at Port Townsend is also merely a site with an officer in charge. The State Board has requested the Secretary of the Treasury to equip them at once with modern apparatus. Surgeon-General Wyman has responded that it would be done at once.

THE EFFICACY OF LAND QUARANTINE IN RESTRICTING AND PREVENTING CHOLERA.

It is the intention of the State Board of Health, as soon as the emergency arises, to establish refuge stations at the points of entry of railroads into the State, and to exhaust every resource authorized by the laws of the State to prevent cholera from passing our borders.

As much stress is laid by many on the value of land or interstate quarantine, it is deemed advisable to discuss the situation in some of its bearings to discover what such quarantine implies when called *absolute*, and what authority is given by the State laws to attempt it. This must not be construed into a plea for the abandonment or relaxation of any effort to prevent the ingress of cholera, but it is intended to put the people on their guard lest they depend more on quarantine than on cleanliness, and to show that the laws of the State will neither sanction nor supply the means for an *absolute* land quarantine. Let not the issue be clouded. It is against the practicability of *absolutism* that this is urged.

The prevalence of cholera in Europe and its presence in New York harbor, brings the people of California to a point where they must either adopt all the approved methods known to science to prevent its introduction and fatal spread among our people, or give free entry to the scourge and let it march unimpeded, spreading death and terror in its wake.

The only means to be employed to keep it out of the State when it has once invaded the continent, is by an absolute quarantine on sea and land. With the assistance of the Government it is not so difficult to do this at our ports; but it is a different matter to so effectually bar the way on the State borders that not even an infected dog may cross the line, nor a crow bring the infection across from an infected carrion on the other side. *Absolute* land quarantine must not be mistaken for practical quarantine.

Many well-informed people, without taking into account the available means with which to overcome the obstacles involved, jump at once to the conclusion that the State authorities could, if they would, absolutely exclude all people, clothing, baggage, mail, express goods, and freight from any suspicious locality from entrance into the State, until all had been put through a process of disinfection, fumigation, and cleansing. Enthusiastic medical men of limited experience also proclaim the ease with which land quarantine can be made absolutely effective. They fail, however, to point out any instances where such ideal land quarantine has proved sufficient to exclude the pest. Their answer is that failure was due to the fact that the quarantine was not absolute. Upon that statement alone any one pleading against the possibility of an absolute land quarantine on the thousand miles of California border could rest his case.

If it be practicable to stop all trains on the Oregon, the Central Pacific at Truckee, the Atlantic and Pacific at Needles, and the Southern Pacific at Yuma, and compel every man, woman, and child, with baggage and freight, to be washed and fumigated, the mail and express matter to be effectually disinfected, and a change of cars made, without any escaping the ordeal, the quarantine might be called effectual; but it would be far from absolute, for measures could scarcely be taken to prevent a passenger from getting off a train before reaching the quarantine station, and riding or walking around it into the State. The enthusiasts will say, place a *cordon militaire* not only around the passengers detained at a refuge station, but along the entire State border, from the ocean on the north along the Oregon border, along the crest of the Sierras, the Nevada border, along the Colorado River, along the Arizona border, then along the Mexican line on the south to the ocean, below San Diego. We might, indeed, feel secure if the State was capable of placing sentinels along its lines so that no loophole could be found to let in the germs of cholera. It might require all the soldiers in the United States service, but nevertheless it would prove that it could be done. Other States might want the same soldiers to patrol their State lines, but in some way, not yet explained, California will be supposed to have obtained a prior claim to them.

This is a picture of absolute land quarantine. Nothing can be more so than to prohibit persons and effects of all kinds whatsoever from passing across our State lines. To prevent them from crossing it is necessary to place a sufficient guard along the whole line. Before the days of railroads people found a way into California, and people have not yet forgotten how to travel without a locomotive.

Will any reflecting person declare practicable the placing of an *absolute* land quarantine along the California border?

The Legislature has defined the powers of the State Board of Health in Section 2979 of the Political Code. It reads as follows:

"An Act to prevent the introduction of contagious and infectious diseases into the State of California.

"Railroad cars to be inspected.

"SECTION 1. Whenever there shall exist, in the opinion of the State Board of Health, imminent danger of the introduction of contagious and infectious diseases into the State of California, by means of railroad communication with other States, the said State Board of Health are authorized, and it is hereby made their duty, to make, or cause to be made, by an accredited agent or inspector, an inspection of all rail cars coming into the State at such point, or between such points within the State limits as may be selected for the purpose.

"Detention of train a minimum.

"SEC. 2. Such inspection shall be made, where practicable, during the ordinary detention of a train at a station, or while in transit between stations, and in all cases shall be so conducted as to occasion the least possible detention or interruption of travel, or inconvenience to the railroad companies, so far as consistent with the purposes of this Act.

"Infected cars to be side-tracked.

"SEC. 3. Should the discovery be made of the existence among the passengers of any case or cases of dangerous, contagious or infectious disease, the said Board of Health, or their agent or inspector, under rules and conditions prescribed by them as applicable to the nature of the disease, shall have power to cause the side-trucking or detention of any car or cars so infected; to isolate the sick or remove them to a suitable place for treatment; to establish a suitable refuge station; to cause the passengers and materials in such infected car to be subjected to disinfection and cleansing before proceeding farther into the State, and in case of smallpox to offer free vaccination to all persons exposed in any car or at any station."

It will be noticed that the above Act does not authorize the State Board to attempt anything like an absolute quarantine.

The greatest enthusiast, who has not yet shaken off the notion of absolutism imbibed

in foreign despotisms, will find but little in the law authorizing and empowering the sanitary officials of the State to attempt an *absolute* inhibition of travel and traffic, or to attempt to guard the State lines. While the attempt has been made in countries where militarism was most *absolute*, the result has never proven it to be sufficient. The military have been unable to prevent dogs from crossing their lines; cats have sneaked across in the night from an infected hovel on the other side; pigeons, crows, ravens, vultures, and other birds have flown across; water charged with the germs has run down hill across the sentinel's path, to slake the thirst of its victim on the other side.

These by no means impossible methods of getting cholera across the lines of a *cordon militaire* seem to be ignored by those who would allay public apprehension, by preaching the doctrine of an absolute and impenetrable land quarantine.

This is the character of barrier they would place around the State, instead of inculcating, by precept and example, the doctrine of personal, domestic, and municipal cleanliness.

If the people of California allow themselves to be lulled into a feeling of inactive security through confidence in the efficacy and sufficiency of an interstate land quarantine, maintained in the most rigorous manner, sanctioned by the police power of the State, and enforced by all the means at her disposal, they will commit a most serious error.

Such a quarantine will certainly be made and maintained with a sternness that would appall the impractical idealist by its inflexibility, but as has been shown above, even the domestic animals may carry the germs across the line, and a pig may root in an infected garbage pile and unconsciously thwart the theory of the believer in the practicability of an absolute land quarantine, by carrying it across the line.

What immunity have the people then from the much-dreaded cholera? None at all, except that which is with certainty obtained by cleanliness. This, it will be urged, is impracticable in some quarters. Clean up your own premises, then; clean the well; empty and disinfect the cesspool and privy vault; cleanse the house drains; allow no garbage heaps on your premises; ventilate your basements, and you have made an excellent beginning. Then get your neighbor to do the same, and get the town, village, or city authorities to adopt like measures. A town, like a private house, has a source of water supply to look after and a sewer system with a place of discharge. It has its slaughter-houses and glue factories, its crowded tenement houses, and festering plague spots. Create a sentiment in your community to remove them. No matter if your neighbor has a vested interest in those nuisances, he has no right to use his property in a way to endanger others.

Look to your local Health Boards and back them in their efforts to place your town in a condition to resist the invader by depriving him of subsistence. Starve the cholera. It cannot exist and propagate without some form of filth to breed in. Destroy the filth, allow none to accumulate, drink boiled water, and eat cooked food, and your chances of taking cholera will be so small it need not be taken into account. Become a disciple of land quarantine sufficiency, and retain your accustomed domestic and municipal nuisances, and you will furnish the destroyer a harvest that will fatten the earth with moldering human flesh. It is for the people to choose whose advice they will follow in this emergency.

It is better to be prepared for the worst. Persons having a slight diarrhoea will conceal the fact and pass the Inspector, and yet the discharges may contain the germs of cholera, and be scattered along the line of railroad to infect others. The infectious germs once arrived in a locality will never be able to do any damage if they do not meet with a soil favorable for their reproduction.

Pay no heed, then, to those emotional persons who theorize on the practicability of absolute land quarantine, but become a disciple and a follower of cleanliness and purity. The State Board has authorized the publication of a circular on "Cholera; its Restriction and Prevention," for general distribution. It is designed both for the medical profession and the people.

COUNTY HEALTH OFFICERS.

It is believed that the County Supervisors could do no better than appoint a competent and energetic physician as County Health Officer to supervise the sanitary condition of all public buildings and small hamlets that have no health officer, and to abate all nuisances outside of corporate limits. This is no time for parsimony and niggardliness in expenditures. The epidemic once here, the ones who now express contempt for it will be the first to run away. A number of small towns have shown commendable activity in preparation for what may come.

[illegible]

SEPTEMBER, 1892.

Mortality reports from 119 cities, towns, villages, and sanitary districts, having an aggregate population of 838,169, give 965 deaths from all causes during September. This corresponds to a death-rate of 1.15 per 1,000 per month, or 13.80 per annum.

There were 132 due to consumption, 39 to pneumonia, 9 to congestion of the lungs, 23 to bronchitis, 20 to diarrhoea and dysentery, 38 to cholera infantum, 53 to other diseases of the stomach and bowels, 30 to diphtheria, 10 to scarlatina, 1 to smallpox, 9 to whooping-cough, 24 to typhoid fever, 9 to malarial fevers, 9 to cerebro-spinal fever, 27 to cancer, 2 to erysipelas, 72 to diseases of the heart, 6 to alcoholism, and 438 to all other causes.

PREVAILING DISEASES.

Reports of prevailing diseases from 73 towns and districts outside of the larger cities show 16 cases of pneumonia, 104 of bronchitis, 16 of diarrhoea, 94 of dysentery, 124 of cholera morbus, 91 of cholera infantum, 28 of diphtheria, 9 of croup, 32 of scarlatina, 17 of measles, 2 of smallpox, 51 of whooping-cough, 66 of influenza, 80 of typhoid fever, 368 of malarial fevers, 27 of erysipelas, 106 of rheumatism, 11 of cerebro-spinal fever, 109 of neuralgia, 92 of tonsilitis, 14 of pharyngitis, 18 of inflammation of the bowels, and 16 of inflammation of the kidneys.

September was a healthy month. There was an absence of epidemic disease, and the autumn weather over the entire State has been delightful, though above normal in temperature for September.

SMALLPOX.

A case of smallpox was reported from Red Bluff, in a woman who came from British Columbia by water. Isolation of the patient, with vaccination of all persons believed to have been exposed, proved sufficient to prevent its spread. The patient is dead. Another was reported in Oakland. In this case the contagion came by water from Mexico. The same precautions led to like results as in the first case, and the patient is discharged, with no spread of the disease.

ASIATIC CHOLERA.

The United States is to be congratulated on its escape from the cholera this year. New York City is to be complimented upon its successful effort to repress the invasion of the pest. The approach of winter made the efforts great and efficient as they were, successful. The same efforts made in the last week of June might not result so favorably. We may hope that the rigors of a severe winter will put an end to the march of the epidemic, but it must be remembered that it has wintered in Russia and broken out in the spring. It is but logical to infer that it can only reach us next summer as a foreign importation. If it effects a lodgment on our shores in the early summer, it will in all probability spread over the continent. The efforts that have been made to place our habitations in good sanitary condition will not be lost, even if cholera does not come. The result will be observed for many months in a lessened death-rate from diphtheria, typhoid, and other fevers and minor ailments that arise from breathing emanations from decomposing animal and vegetable matter. The villages and smaller towns should, during the coming winter, while the ground is moist, improve their drainage. Very little effort in that direction has been made outside of the cities in California. In summer, while the ground is hard and dry, and the people engaged in agricultural pursuits, little is ever done in the way of such improvements. But no excuse can be advanced for not doing this work in the rainy months of winter, when there are idle hands enough to complete all that need be done to place many of the small towns in perfect sanitary condition. Many beautiful hamlets, and some summer resorts, have no means provided for drainage, or have no sewers, and all refuse matter and house drainage are allowed to soak into the ground. It will be a paying investment to make all needed improvements of this character during the winter, and everywhere abandon as nearly as possible the abominable cesspool system. People living in the country towns may profitably bear in mind that in case of a cholera epidemic, the residents of cities will flee to the country and spread the contagion, and that small places not infrequently suffer in greater proportion than the larger towns. As a matter of economy a good system of sewers in a country village is always a paying investment. It acquires a reputation for salubrity, and induces the location of people of wealth and refinement, the building up of industries, and a rapid increase of population and enhancement in real estate. No sensible man will spend much money in beautifying a home where he cannot count on an ample supply of pure water and pure air. Pure air cannot be obtained around human habitations where there are no means for the speedy removal of all refuse matter or waste, whether fluid or solid.

[illegible]

ABSTRACT FOR SEPTEMBER, 1892—Continued.

Other Causes	2	1	1	1	2	438
Alcoholism	1	1	1	1	1	6
Heart Diseases	1	1	1	1	1	72
Erysipelas	1	1	1	1	1	2
Cancer	1	1	1	1	1	27
Cerebro - Spinal Fevers	1	1	1	1	1	9
Remittent and Inter-mittent Fevers	1	1	1	1	1	9
Typhoid Fever	1	1	1	1	1	24
Typho - Malarial Fever	1	1	1	1	1	1
Whooping-Cough	2	1	1	1	1	9
Smallpox	1	1	1	1	1	1
Measles	1	1	1	1	1	0
Scarlet Fever	1	1	1	1	1	20
Croup	1	1	1	1	1	10
Diphtheria	1	2	1	1	1	30
Other Diseases of Stomach & Bowels	1	1	1	1	1	53
Cholera Infantum	1	1	1	1	1	38
Diarrhoea and Dysentery	1	1	1	1	1	20
Congestion of the Lungs	1	1	1	1	1	9
Acute Bronchitis	1	1	1	1	1	23
Acute Pneumonia	1	1	1	1	1	39
Consumption	1	1	1	1	1	132
Total Deaths	5	0	4	2	0	965
Estimated Population	9,000	4,500	2,500	1,000	3,000	838,169
Ventura and vicinity	9,000	4,500	2,500	1,000	3,000	838,169
Vacaville and vicinity	4,500	2,500	1,000	3,000	300	838,169
Watsonville and vicinity	2,500	1,000	3,000	300	3,069	838,169
Wheatland	1,000	3,000	300	3,069	838,169	838,169
Willows and vicinity	3,000	300	3,069	838,169	838,169	838,169
Williams	500	300	3,069	838,169	838,169	838,169
Woodbridge	300	3,069	838,169	838,169	838,169	838,169
Woodland	3,069	838,169	838,169	838,169	838,169	838,169
Totals	9,000	4,500	2,500	1,000	3,000	838,169

OCTOBER, 1892.

Mortality reports from 111 cities, towns, villages, and sanitary districts, having an aggregate population of 808,603, give 959 deaths from all causes in October. This corresponds to a death-rate of 1.18 per 1,000 for October, or 14.16 per 1,000 per annum.

There were 117 due to consumption, 46 to pneumonia, 25 to bronchitis, 2 to congestion of the lungs, 29 to diarrhoea and dysentery, 38 to cholera infantum, 67 to other diseases of the stomach and bowels, 21 to diphtheria, 15 to croup, 18 to scarlatina, 1 to measles, 3 to whooping-cough, 41 to typhoid fever, 6 to malarial fevers, 1 to cerebro-spinal fever, 35 to cancer, 2 to erysipelas, 73 to diseases of the heart, 8 to alcoholism, and 411 to all other causes.

PREVAILING DISEASES.

Reports of prevailing diseases from 73 towns and sanitary districts outside of the large cities show 36 cases of pneumonia in October, 25 of pleurisy, 12 of congestion of the lungs, 161 of bronchitis, 292 of diarrhoea, 49 of dysentery, 76 of cholera morbus, 42 of cholera infantum, 57 of diphtheria, 13 of croup, 41 of scarlatina, 7 of measles, 34 of whooping-cough, 94 of influenza, 69 of typhoid fever, 365 of malarial fevers, 22 of erysipelas, 133 of rheumatism, 1 of cerebro-spinal fever, 89 of neuralgia, 161 of tonsilitis, 12 of pharyngitis, 18 of inflammation of the bowels, and 11 of inflammation of the kidneys.

October has added another to the lists of healthy months. There has been no considerable prevalence of any contagious disease. The temperature for the month was above normal. This is shown in the number of cases of diarrhoea and cholera morbus reported. The cool nights, with a rapid radiation of heat from the earth's surface, gave, as a result of sudden changes of temperature, many cases of tonsilitis, and have, no doubt, had an influence on the number of cases of rheumatism reported. Ninety-four cases of la grippe would argue that we are still entertaining that unwelcome guest, and it is quite reasonable to expect a renewal of activity of the epidemic with the approach of winter weather. It would be interesting to ascertain with certainty a large number of cases where persons are known to have had more than one attack. This may be done during the approaching winter, so as to dispel all possible doubt on the subject.

ABSTRACT FOR OCTOBER, 1892—Continued.

[illegible]

NOVEMBER, 1892.

Mortality reports from 103 cities, towns, villages, and sanitary districts, having an aggregate population of 793,693, give 1,087 deaths from all causes in November. This corresponds to a death-rate of 1.36 per 1,000 per month, or 16.32 per annum.

There were 172 deaths due to consumption, 87 to pneumonia, 31 to bronchitis, 15 to congestion of the lungs, 18 to diarrhoea and dysentery, 20 to cholera infantum, 59 to other diseases of the stomach and bowels, 30 to diphtheria, 17 to croup, 16 to scarlatina, 5 to whooping-cough, 36 to typhoid fever, 2 to malarial fevers, 8 to cerebro-spinal fever, 40 to cancer, 3 to erysipelas, 94 to diseases of the heart, 7 to alcoholism, and 427 to all other causes.

PREVAILING DISEASES.

Reports of prevailing diseases from 67 localities outside of the large cities, show 63 cases of pneumonia, 13 of congestion of the lungs, 158 of bronchitis, 37 of pleurisy, 188 of diarrhoea, 34 of dysentery, 27 of cholera morbus, 13 of cholera infantum, 46 of diphtheria (28 of which were reported from Lodi), 12 of croup, 38 of scarlatina (it being reported epidemic at Elk Grove), 2 of measles, 1 of smallpox, 51 of whooping-cough, 119 of la grippe, 71 of typhoid fever, 214 of malarial fevers, 23 of erysipelas, 106 of rheumatism, 12 of cerebro-spinal fever, 75 of neuralgia, 151 of tonsilitis, 28 of pharyngitis, and 48 of enteritis.

San Rafael and Ventura report an epidemic of whooping-cough, and Azusa reports la grippe epidemic. Fresno reports a case of leprosy, cared for in the county pest-house. No history of the case has been given. A case of confluent smallpox was reported by Dr. B. T. Mouser, of North Temescal, the following letter being self-explanatory. There is some doubt, however, as to the disease having been contracted at Fresno, as the disease has not been reported from that point for many months:

"NORTH TEMESCAL, November 30, 1892.

"J. R. LAINE, *M.D.*:

"DEAR DOCTOR: The case of smallpox in this locality was in all probability contracted in Fresno, though the stage of incubation must have been unusually long. I have investigated the premises where the patient had been stopping for some days before going to the Fabiola Hospital, and fumigated the same. This case has no connection with those in Oakland, under quarantine, and believed by many to be chickenpox. Patient reported by me is one of the confluent type, and is being treated by Dr. Johnson, County Physician. Every precaution is being taken to prevent spread of the disease; but the school trustees have not had vaccination in this district for many years, though I have drummed them up repeatedly.

"Yours, etc.,

"B. T. MOUSER.

A copy of the Twelfth Biennial Report of the California State Board of Health has been sent to each local Board of Health. In addition to a synopsis of the sanitary work of the past two years, it contains the sanitary laws of the State. This to local Boards will constitute its chief value, as it will be found useful for ready reference in matters relating to sanitary affairs. If Secretaries of local Boards will forward the names and addresses of the members of their Boards a copy will be forwarded to each. They will also be sent to any one else who applies for a copy.

	800	2	1	31	15	18	20	20	59	30	17	16	0	0	5	36	2	8	40	3	94	7	427
Pleasanton.....	800	2	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Red Bluff and vicinity.....	5,000	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Redlands and vicinity.....	3,600	2	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rio Vista and vicinity.....	1,800	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rutherford.....	200	1	6	2	—	—	—	—	—	2	1	—	—	—	—	2	—	1	—	—	—	—	—
Sacramento.....	28,000	31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15
San Leandro.....	2,000	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
San Bernardino.....	8,000	12	2	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	7
San Diego.....	16,153	13	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4
San Francisco.....	330,000	540	75	51	20	13	5	6	35	12	10	10	—	—	—	11	—	1	20	2	42	2	289
San José.....	18,027	35	8	1	1	—	—	1	1	1	1	1	—	—	—	—	—	—	—	—	—	—	16
San Luis Obispo.....	5,000	12	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7
San Mateo.....	2,500	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
San Pedro.....	1,500	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Rafael.....	3,800	3	—	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Santa Ana and vicinity.....	15,000	8	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	2	—	—	—	—	—
Santa Barbara.....	5,864	9	1	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	2
Santa Cruz and vicinity.....	10,000	7	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	4
Santa Rosa.....	5,213	8	—	—	1	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	4
Santa Paula and vicinity.....	2,000	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
Solano Co., Dist. No. 2.....	1,000	3	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
Sutter County.....	5,439	7	2	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—	—	—	—
Stockton.....	14,373	24	6	2	1	1	—	1	1	2	1	—	—	—	—	—	—	—	—	—	—	—	10
St. Helena and vicinity.....	2,500	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Susanville.....	800	7	4	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Soquel.....	250	3	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Truckee and vicinity.....	1,300	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Trinity County.....	4,000	5	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Upper Lake.....	300	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vallejo.....	6,000	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ventura and vicinity.....	7,000	9	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vacaville and vicinity.....	4,500	3	1	—	—	—	1	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Watsonville and vicinity.....	2,500	8	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Weaverville.....	768	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Winters.....	1,000	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Williams.....	500	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Woodbridge.....	300	2	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
Woodland.....	3,069	6	1	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Totals.....	793,693	1,087	172	87	31	15	18	20	59	30	17	16	0	0	5	36	2	8	40	3	94	7	427

DECEMBER, 1892.

Mortality reports from 108 cities, towns, villages, and sanitary districts, having an aggregate population of 818,764, give 1,155 deaths from all causes in December. This corresponds to a death-rate of 1.41 per thousand, or 16.92 per annum.

There were 189 due to consumption, 134 to pneumonia, 51 to bronchitis, 6 to congestion of the lungs, 14 to diarrhoea and dysentery, 14 to cholera infantum, 50 to other diseases of the stomach and bowels, 27 to diphtheria, 15 to croup, 9 to scarlatina, 1 to smallpox, 2 to whooping-cough, 24 to typhoid fever, 3 to cerebro-spinal fever, 40 to cancer, 1 to erysipelas, 100 to diseases of the heart, 8 to alcoholism, 1 to la grippe, and 467 to all other causes.

Zymotic diseases caused 1.48 per cent of all the deaths during the month. December compares favorably with the corresponding month of the past three years. In December, 1890, the death-rate per 1,000 of the population was 1.67, in December, 1891, 2.19 per 1,000, while the past month reached but 1.41 per 1,000. One death from smallpox was reported from Temescal.

Dr. D. W. Mott, of Santa Paula, reported but one death from his locality. It occurred in a female native of the Atlantic States, aged 103 years. He added in parenthesis the information that she had both smoked and chewed tobacco since 16 years of age.

PREVAILING DISEASES.

Reports of prevailing diseases from 70 towns and sanitary districts outside of the large cities show 75 cases of pneumonia, 229 of bronchitis, 49 of pleurisy, 6 of congestion of the lungs, 134 of diarrhoea, 36 of dysentery, 28 of cholera morbus, 5 of cholera infantum, 38 of diphtheria, 15 of croup, 33 of scarlatina, 126 of measles, 6 of smallpox, 39 of whooping-cough, 250 of influenza, 46 of typhoid fever, 272 of malarial fevers, 9 of cerebro-spinal fever, 29 of erysipelas, 129 of acute rheumatism, 126 of neuralgia, 162 of tonsillitis, and 18 of pharyngitis. Diarrhoea was very prevalent in the vicinity of Napa in the early part of the month, without an ascertained cause. Scarlatina was reported epidemic at Elk Grove, while whooping-cough was quite prevalent at Merced and Rocklin. La grippe was reported from thirty-two localities, in some as epidemic; but it is known to have been quite generally distributed throughout the State, though in a milder form than observed during the last two winters. In several of the localities it was reported epidemic.

Three cases of smallpox were reported from San Francisco. The origin of the disease could not be determined. The preventive measures adopted were strict quarantine by removal to smallpox hospital, the vaccination of all exposed persons, and disinfection of premises occupied by the patients, where discovered. Another case is reported, from Fresno, as being a patient in the pest-house, with all precautions taken. Dr. E. S. O'Brien, of Merced, reported that Dr. Castle, of his city, had informed him that he had attended a case thirty miles east of that place, in Mariposa County. No further particulars have been obtained. Another case has been reported at Swingle Station, ten miles west of Sacramento, very recently; source of contagion unknown. Strict seclusion and vaccination of exposed persons are the measures that have been adopted.

A resolution in force makes it obligatory on the Secretary of the State Board of Health to promptly notify the secretaries of all other State and Provincial Boards of Health of any cases of smallpox in the State, the object being to restrict the disease to the narrowest possible limits. The Code provides for notification of all dangerous contagious or infectious diseases by local Boards of Health. Prompt reports of localities, source, and measures taken, will enable the Secretary to comply with the provisions of the resolution with reference to each case of smallpox.

Now is a good time to vaccinate. The contemplation of the probabilities of an epidemic of cholera during the coming summer should not dull our sensibilities concerning other necessities. With several points in the interior of the State for smallpox to start from, it is quite probable that it will spread to some considerable extent before it can be stamped out. Too much energy cannot be employed in this direction.

Abstract of the Reports of Deaths and their Causes in the following Cities and Towns of California during December, 1892.

[illegible]

JANUARY, 1893.

Reports from 112 cities, towns, villages, and sanitary districts, having an aggregate population of 841,285, show a total of 1,218 deaths from all causes. This corresponds to 1.44 per 1,000 for January, or 17.28 per 1,000 per annum.

There were 211 due to consumption, 107 to pneumonia, 86 to bronchitis, 10 to congestion of the lungs, 3 to diarrhoea and dysentery, 2 to cholera infantum, 54 to other diseases of the stomach and bowels, 24 to diphtheria, 13 to croup, 18 to scarlatina, 1 to smallpox, 2 to whooping-cough, 19 to typhoid fever, 3 to malarial fevers, 7 to cerebro-spinal fever, 42 to cancer, 1 to erysipelas, 110 to diseases of the heart, 4 to alcoholism, and 501 to all other causes, 1 being from la grippe. The mortality for January is lower than the corresponding month of the last two years. In January, 1891, it was 1.64; in January, 1892, 1.95; while in January, 1893, it was 1.44. In 1891, there were, during January, 397 deaths from diseases of the respiratory organs, 595 in 1892, and 414 during last January.

PREVAILING DISEASES.

Reports from 87 towns, villages, and sanitary districts outside of the large cities, give 154 cases of pneumonia, 286 of bronchitis, 57 of pleuritis, 31 of congestion of the lungs, 109 of diarrhoea, 35 of dysentery, 9 of cholera morbus, 17 of diphtheria, 22 of croup, 65 of scarlatina, 44 of measles, 37 of whooping-cough, 521 of la grippe, 24 of typhoid fever, 201 of malarial fevers, 8 of cerebro-spinal fever, 27 of erysipelas, 154 of rheumatism, 124 of neuralgia, 164 of tonsilitis, 56 of pharyngitis, and 9 of inflammation of the kidneys. Measles was reported epidemic at Folsom, and whooping-cough at Merced and Ventura.

SMALLPOX.

Since the December report was issued a number of communications have been received from health officials regarding the prevalence of this disease in and about San Luis Obispo, but no report was received from that town at all. There was a Board of Health, but it never made a report of mortality or prevailing diseases. Since the breaking out of smallpox, the Board of Health has been changed throughout, and the new Board, it is hoped, will comply with the law in making monthly reports. There was a manifest attempt to suppress the truth, inasmuch as no information could be obtained by correspondence. In view of the alarm felt in all the neighboring towns and throughout the country, it was found necessary to dispatch a Special Inspector, in order to ascertain the exact condition of affairs at that and other points, in order to see that all necessary precautions were being taken to prevent the spread of the disease, if it existed, as currently reported. The following is the report of the Inspector, Dr. L. A. Elster:

"SACRAMENTO, February 10, 1893.

"J. R. LAINE, M.D., *Secretary State Board of Health, Sacramento, Cal.*:

"SIR: Pursuant to your instructions, I have carefully investigated the outbreak of smallpox at San Luis Obispo and vicinity, and report as follows:

"The first case was that of Frank Jefferson, who came through by train over the Oregon route from the State of Washington, where he had been employed as a laborer on the Great Northern Railway. His case was recognized in the stage of eruption by Dr. Nichols, of San Luis Obispo, Chief Surgeon of the railroad contractors' camp near Santa Margarita. He was removed to a sufficient distance from the camp, and with his nurse, carefully isolated. It was in the confluent form, but he made a prompt recovery.

"Case No. 2 was a man who occupied the same tent, and had varioloid, from which he made a good recovery.

"Case No. 3 was a man who had slept with No. 2, and left the employ of the contractors before the development of the disease. In the interval he went to San Luis Obispo, and was in the town several days, until he became sick and applied for care at the camp. Dr. Nichols applied to the County Supervisors for the establishment of a pest ward near the camp, but this was refused on the ground that the contractors should take care of their own men. The contractors disclaimed responsibility for this patient, as he had left their employ, and the keeper of the Southern Pacific Hotel at Santa Margarita (where the patient had taken lodgings) had him conveyed to the County Hospital and left upon the grounds at night. The Steward of the hospital placed him in the pest ward, as the only alternative other than allowing him to die without shelter or care, but unfortunately the ward was occupied by two chronic patients, who contracted the disease, from which, however, they recovered, but No. 3 died.

"Case No. 6 was employed as a nurse to cases 3, 4, and 5, but not being protected, he contracted the disease, which, however, was not developed until he had returned to his home in the town. On the appearance of the disease his house was placed under a guard, and the yellow flag displayed. The patient died, but no other cases are known to have occurred from that source.

"Eight other cases occurred in the town, in which the source of infection was not clearly traced, but may be presumed to have arisen from some one of those detailed. Three other cases also occurred at the County Hospital, which, with those last mentioned, are all convalescent. It appears that of the cases which occurred within the town, no one has been so neglected as to prove a source of infection to others outside the houses in which they were. But a state of panic arose, in which the Town Trustees 'voted out' the members of the Board of Health, and elected a new Board, who issued a

circular addressed to all residents of the town, urging them to cleanliness and thorough disinfection of all premises, the retention of children within their homes, the avoidance of public gatherings, and the prompt report of all suspicious cases. They provided for public vaccinations and urged its general employment. They also caused to be printed and distributed, under the head of 'Health Rules,' instructions concerning isolation of patients and nurses, disinfection of clothing, bedding, and houses, and destruction of such bedding and clothing as, in the judgment of the Health Officer, could not be completely disinfected.

"At the time of my visit the Health Officer, Mr. W. J. Oaks, was devoting his whole attention to the work of stamping out the disease, and from personal observation I am convinced that there was no lack of effort to prevent its further extension. The schools were closed and public gatherings forbidden, and I thought it proper to say, through the local press, that there was then no more danger to persons visiting the town on business than if no smallpox cases had ever existed there. This public statement seemed to me desirable in justice to the business of the town, because many persons in the town and vicinity were suffering from alarm, which, however well founded at the outset, was now both needless and harmful. Concerning the present condition of the railway camp, I found Dr. Warren Brown, assistant to Dr. Nichols, in charge, and in company with him visited the site of the tents where the first cases occurred, and the site to which they were removed. Each showed the remains of fires in which all combustibles had been burned, including, at the latter site, the tents which had been occupied by patients, as well as that occupied by the nurse. There were no cases of the disease in the camp except that Mr. Stone, a brother of the contractor, was, at the time of my visit, showing symptoms which had led to exclusion of all persons liable to the infection, and I was requested to see him. I regarded him as a probable case (though as yet the eruption had not appeared in the fauces nor elsewhere), and recommended that arrangements be made to have him admitted to the pest ward of the County Hospital as a pay patient. On my return to San Luis Obispo, I reported the case to the proper authorities, and received their assurance of coöperation with those of the railway camp for the interest of the public health. The hospital ward being so isolated and now so guarded as to preclude all danger to the town, it was evidently better to remove all new cases there than to establish another center where the facilities for care of patients could not equal that of the County Hospital.

"Five cases are reported in San Luis Obispo since my visit there, but all among persons then known to have been exposed and therefore not indicative of danger to those in other houses. The case of Mr. Charles W. Merritt, of Santa Maria, who was treated in San Francisco, should be noticed in connection with these cases, because the history shows it probable that he was infected from the same source which caused that of Frank Jefferson (Case No. 1). Mr. Merritt came down on the train, and was in the smoking car where were some laborers bound for the railroad camp near Santa Margarita. Subsequently he went to San Francisco, and while there developed the disease, being the first case in that city during the present season, and possibly the source of the six cases which have since occurred there. The record of the cases since December 1st, in San Francisco, is as follows: Case No. 1, Charles W. Merritt, of Santa Maria, Cal., at 331 Turk Street, reported December 3, 1892, released January 4, 1893. Case No. 2, Miss Margaret Healy, from 111½ Minna Street, to pest-house, December 19th; result, recovered. Case No. 3, Captain John Smith, 305 Turk Street (same block with Case 1), reported December 24th, released January 24th. Cases Nos. 4, 5, and 6, Willie, Alrich, and George Ramensperger, 2394 Howard Street, reported January 14th; one died January 22d, two released February 3d. Case No. 7, John Schobius, removed January 21st, from Ward K, City Hospital, to pest-house.

"The report of cases of smallpox at Santa Cruz proved false. No cases have occurred there this season.

"The first case in the vicinity of Sacramento was an employé who left the railroad camp near Santa Margarita early in December, and after three weeks arrived at the house of his brother-in-law, Mr. Shoup, who, with four of his children, contracted the disease from him. They were reported to the Health Officer of the city, Dr. H. L. Nichols, who took all care and prevented the extension of the disease in adjacent houses. Another child of Mr. Shoup, an infant, had escaped the first infection, but two weeks later developed the disease, while the mother, who had been vaccinated, has so far escaped it, and the house has been carefully disinfected under direction of Dr. Nichols, so that no further danger is apprehended at that point. The second case was that of Mr. Swingle, of Swingle Station, January 1, 1893. Having been vaccinated, he had a case of varioloid, from which he made a prompt recovery. The most thorough care was used to prevent infection, and no others suffered from that source. Concerning the source of infection in this case, I learn from the father of the patient that his son had passed through the railway depot near his ranch about nine days previous to his attack, and there saw a man who seemed to be sick, and had an eruption, which a comrade, who had had the disease, declared to be smallpox. It is surmised that this unknown patient was the same who is described as the first case, and that he was then on his way to Sacramento, where he arrived four or five days later. The first case treated in the Sacramento pest-house, John Cuff, came from a railway camp near Delta. He was admitted to the Railroad Hospital January 20th, and two days later was found to be a case of smallpox, and removed to the pest-house, where he died January 30th. Two cases resulted from his stay in the Railroad Hospital—a nurse and a patient who lay in the cot next to Cuff. Both were cases of varioloid, and are reported convalescent.

"Total number of cases reported, 41; deaths, 7; discharged, 31; convalescent, 3.

"It is to be regretted that due attention has not been given in some localities to the law requiring reports to the State Board of Health of 'all cases of contagious diseases,' and to be hoped that in all portions of the State, local Boards will comply with this provision, as by prompt action the spread of such diseases may be limited, and the life and health of many preserved. It is reasonably sure that twenty-two cases in San Luis Obispo and the railway camp near Santa Margarita, the case of Mr. Merritt, and possibly others at San Francisco, and eight of the cases near Sacramento, were all infected from a single source.

"The loss of life, the physical suffering, and the injury to business interests represented by these thirty cases, largely outweigh the slight expenditure which, at the proper time and place, might have prevented the entrance of the first source of infection from the north. I wish to acknowledge here the uniform courtesy extended to me as your representative, by the local Boards of Health of San Luis Obispo, San Francisco, and Sacramento, and the physician and superintendent of the railway camp near Santa Margarita.

"Very respectfully,

"L. A. ELSTER, M.D.,
"Special Inspector."

[illegible]

ABSTRACT FOR JANUARY, 1893—CONTINUED.

Other Causes	—	1	501
Alcoholism	—	—	4
Heart Diseases	—	—	110
Erysipelas	—	—	1
Cancer	—	—	42
Cerebro - Spinal Fever	—	—	7
Remittent and In- termittent Fevers	—	—	3
Typhoid Fever	—	—	19
Typho - Malarial Fever	—	—	—
Whooping-Cough	—	—	2
Smallpox	—	—	1
Measles	—	—	0
Scarlet Fever	—	—	18
Croup	—	—	13
Diphtheria	—	—	24
Other Diseases of St'mach & Bow'ls	—	—	54
Cholera Infantum	—	—	2
Diarrhoea and Dys- entery	—	—	3
Congestion of the Lungs	—	—	10
Acute Bronchitis	—	—	86
Acute Pneumonia	—	1	107
Consumption	1	—	211
Total Deaths	1	2	1,218
Estimated Popula- tion	300	3,500	841,285
Woodbridge	—	—	—
Woodland	—	—	—
Totals	—	—	—

FEBRUARY, 1893.

Reports from 98 cities, towns, villages, and sanitary districts, aggregating a population of 801,581, show a total of 1,019 deaths from all causes in February. This corresponds to a death-rate of 1.27 per 1,000 for the month, or 15.24 per 1,000 per annum.

There were 187 due to consumption, 121 to pneumonia, 34 to bronchitis, 6 to congestion of the lungs, 6 to diarrhoea and dysentery, 51 to other diseases of the stomach and bowels, 21 to diphtheria, 8 to croup, 14 to scarlatina, 3 to smallpox, 3 to whooping-cough, 18 to typhoid fever, 8 to cerebro-spinal fever, 1 to malarial fevers, 29 to cancer, 1 to erysipelas, 89 to diseases of the heart, 3 to alcoholism, and 416 to all other causes, among which 7 were due to la grippe.

PREVAILING DISEASES.

Reports from 73 towns, villages, and sanitary districts outside of the large cities, give 122 cases of pneumonia, 267 of bronchitis, 32 of pleurisy, 30 of congestion of the lungs, 66 of diarrhoea, 20 of dysentery, one of cholera morbus, 9 of cholera infantum, 9 of diphtheria, 19 of croup, 32 of scarlatina, 48 of measles, 69 of whooping-cough, 615 of la grippe, 16 of typhoid fever, 133 of malarial fevers, 4 of cerebro-spinal fever, 19 of erysipelas, 125 of rheumatism, 121 of neuralgia, and 147 of tonsillitis.

SMALLPOX.

Two deaths from this malady were reported from San Luis Obispo as having occurred in February, but late authentic reports show no new cases. All quarantine is raised, and no further danger is apprehended.

The report of smallpox in Woodland was obtained, not from the Health Officer, but from a member of the Board of Health. The first case that appeared came from the smallpox camp at Santa Margarita, to visit his sister at or near Sacramento, where he infected the entire family of seven persons, which were reported in February. From Sacramento he went to Woodland, and it is not unlikely that he infected a young man at Swingle Station on his way to the Yolo County Hospital, where he was received as a patient, and infected other inmates of the hospital before the true nature of his case was recognized. As usual, there was the manifest attempt to suppress facts, and with the common result of such a pernicious policy—which is the inevitable spread of the disease—came distrust, alarm, and avoidance of the town. No reliable information could be obtained, except through the Special Inspector of the State Board of Health, who ascertained that there had been at least ten cases, with two deaths, none of which have been reported directly from or through the health officers of Woodland. It would be as well to abandon forever this injurious notion that the presence of smallpox in a locality is a matter to be concealed. There is no more certain means of causing its spread. The authorities should be at once fully informed, and all precautions speedily taken to limit its spread, after which it should be authoritatively announced that all danger is passed. The history of the epidemic at Woodland proves this to be true, for not until full publicity was given of the true state of the facts were full and ample steps taken to prevent its spread. It is to be hoped that chickenpox will no longer be the name under which modified smallpox is to masquerade. If medical men are to give out that adults enter hospitals on account of chickenpox, it is time to inform the people that any such statement is altogether improbable. Chickenpox is a disease of childhood, and when a grown man is said by a physician to have this malady, it is safe to set it down as a case of modified smallpox, which we call varioloid. Publicity is the only sure means of limiting the spread of the disease, for not until it is recognized will sufficient effort be made to stamp it out.

There was one new case at San Francisco in February.

A case died at Paperville, having contracted the disease at San Francisco.

Another case was discovered at Lone, but in this case, as in the case at Paperville, there was no further spread of the disease.

[illegible]

ABSTRACT FOR FEBRUARY, 1893—Continued.

Other Causes	12	1	—	—	1	1	6	1	2	—	2	1	1	2	416
Alcoholism	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
Heart Diseases	—	1	—	—	—	—	—	1	2	1	—	—	—	—	89
Erysipelas	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Cancer	—	—	—	—	—	—	—	—	—	—	—	—	—	—	29
Cerebro - Spinal Fevers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8
Remittent and Intermittent Fevers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Typhoid Fever	1	—	—	—	—	—	—	—	1	—	—	—	—	—	18
Typho - Malarial Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Whooping-Cough	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
Measles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Scarlet Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14
Croup	—	—	—	—	—	—	1	—	—	—	—	—	—	—	8
Diphtheria	—	—	—	—	—	—	—	—	2	—	—	—	—	—	21
Other Diseases of St'mach & Bow'ls	—	—	—	—	—	—	1	—	—	—	2	—	1	—	51
Cholera Infantum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Diarrhoea and Dysentery	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6
Congestion of the Lungs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6
Acute Bronchitis	2	—	1	—	—	—	—	—	—	—	—	—	—	—	34
Acute Pneumonia	4	—	1	—	—	1	—	1	1	—	—	—	—	—	121
Consumption	5	—	—	1	—	—	—	1	—	—	—	—	—	1	187
Total Deaths	24	0	4	1	0	0	3	7	2	3	7	0	5	1	1,019
Estimated Population	14,376	2,000	2,000	850	250	350	1,300	5,000	7,000	4,500	2,500	1,000	1,000	500	801,581
Stockton	14,376	2,000	2,000	850	250	350	1,300	5,000	7,000	4,500	2,500	1,000	1,000	500	801,581
St. Helena and vicinity	2,000	2,000	2,000	850	250	350	1,300	5,000	7,000	4,500	2,500	1,000	1,000	500	801,581
Solano County, District No. 2	2,000	2,000	2,000	850	250	350	1,300	5,000	7,000	4,500	2,500	1,000	1,000	500	801,581
Susanyville	850	250	350	1,300	5,000	7,000	4,500	2,500	1,000	1,000	500	300	3,500	5,639	801,581
Soquel	250	350	1,300	5,000	7,000	4,500	2,500	1,000	1,000	500	300	3,500	5,639	801,581	801,581
Tehama	350	1,300	5,000	7,000	4,500	2,500	1,000	1,000	500	300	3,500	5,639	801,581	801,581	801,581
Truckee and vicinity	1,300	5,000	7,000	4,500	2,500	1,000	1,000	500	300	3,500	5,639	801,581	801,581	801,581	801,581
Trinity County	5,000	7,000	4,500	2,500	1,000	1,000	500	300	3,500	5,639	801,581	801,581	801,581	801,581	801,581
Tulare City	7,000	4,500	2,500	1,000	1,000	500	300	3,500	5,639	801,581	801,581	801,581	801,581	801,581	801,581
Vallejo	4,500	2,500	1,000	1,000	500	300	3,500	5,639	801,581	801,581	801,581	801,581	801,581	801,581	801,581
Ventura and vicinity	2,500	1,000	1,000	500	300	3,500	5,639	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581
Vacaville and vicinity	1,000	500	300	3,500	5,639	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581
Watsonville	1,000	500	300	3,500	5,639	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581
Wheatland	500	300	3,500	5,639	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581
Winters and vicinity	3,000	1,000	1,000	500	300	3,500	5,639	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581
Willows and vicinity	3,000	1,000	1,000	500	300	3,500	5,639	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581
Williams	500	300	3,500	5,639	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581
Woodbridge	300	3,500	5,639	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581
Woodland	3,500	5,639	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581
Yuba City and vicinity	5,639	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581	801,581
Totals	801,581	1,019	1,019	187	121	34	6	6	0	51	21	8	14	0	3

MARCH, 1893.

Reports from 102 cities, towns, villages, and sanitary districts, aggregating a population of 810,613, show a total mortality of 1,090 from all causes in March. This corresponds to a death-rate of 1.31 per 1,000 per month, or 15.72 per annum.

There were 189 deaths due to consumption, 97 to pneumonia, 45 to bronchitis, 4 to congestion of the lungs, 7 to diarrhoea and dysentery, 1 to cholera infantum, 46 to other diseases of the stomach and bowels, 13 to diphtheria, 5 to croup, 12 to scarlatina, 1 to smallpox, 3 to whooping-cough, 13 to typhoid fever, 3 to malarial fevers, 7 to cerebro-spinal fever, 44 to cancer, 3 to erysipelas, 91 to diseases of the heart, 1 to alcoholism, and 505 to all other causes, among which were 4 cases of la grippe. The death from smallpox was the case reported in February in San Francisco.

PREVAILING DISEASES.

Reports of prevailing diseases from 83 towns and villages outside of the larger cities give 105 cases of pneumonia, 257 of bronchitis, 65 of pleuritis, 33 of congestion of the lungs, 84 of diarrhoea, 9 of dysentery, 5 of cholera morbus, 8 of cholera infantum, 5 of diphtheria, 38 of croup, 34 of scarlatina, 48 of measles, 4 of smallpox, 51 of whooping-cough, 335 of la grippe, 21 of typhoid fever, 181 of malarial fevers, 3 of cerebro-spinal fever, 29 of erysipelas, 160 of rheumatism, 156 of neuralgia, 157 of tonsilitis, 53 of pharyngitis, and 3 of trichinosis.

Measles was reported epidemic at Folsom, and whooping-cough at Folsom, Merced, and Fresno. Four cases of smallpox were reported from Oakland. The usual precautions have been taken, and it is believed that the disease will be stamped out.

SANITARY CONVENTION.

A Sanitary Convention will be held at B'nai B'rith Hall, in San Francisco, on Monday, April 17th, at 1:30 P. M., and continue during the afternoon and evening. This convention is held in order to bring together as many as practicable of those who are interested in public health and general sanitary matters, to discuss questions that touch upon the probabilities of an invasion of our country during the coming months by cholera, and to devise and decide upon a mode of action in concert, and upon a plane as far advanced as the investigations of the scientific world will warrant. The indications are that the meeting will be well attended. Some excellent papers are promised, which, with a synopsis of the discussions which are expected to follow, are to be published for distribution. A general invitation is extended to those interested in sanitary work, whether members of the medical profession or in other walks of life.

APRIL, 1893.

Reports from 114 cities, towns, villages, and sanitary districts, aggregating a population of 858,413, show a total mortality of 953 from all causes in the month of April. This corresponds to a death-rate of 1.11 per 1,000 per month, or 13.32 per annum.

There were 193 deaths due to consumption, 70 to pneumonia, 22 to bronchitis, 3 to congestion of the lungs, 1 to dysentery, 3 to cholera infantum, 52 to other diseases of the stomach and bowels, 16 to diphtheria, 6 to croup, 10 to scarlatina, 8 to whooping-cough, 13 to typhoid fever, 5 to malarial fevers, 6 to cerebro-spinal fever, 26 to cancer, 5 to erysipelas, 77 to diseases of the heart, 5 to alcoholism, and 432 to all other causes.

PREVAILING DISEASES.

Reports of prevailing diseases from 63 towns and villages outside of the larger cities, give 52 cases of pneumonia, 156 of bronchitis, 33 of pleuritis, 16 of congestion of the lungs, 77 of diarrhoea, 11 of dysentery, 13 of cholera morbus, 7 of cholera infantum, 19 of diphtheria, 19 of croup, 33 of scarlatina, 91 of measles, 86 of whooping-cough, 205 of la grippe, 9 of typhoid fever, 199 of malarial fevers, 3 of cerebro-spinal fever, 24 of erysipelas, 106 of rheumatism, 139 of neuralgia, 124 of tonsilitis, and 65 of pharyngitis.

Scarlatina was reported epidemic at Knight's Ferry, measles at Merced and Elk Grove, whooping-cough at Hollister, and tonsilitis at Williams. Epidemic of measles and whooping-cough at Folsom is reported declining.

Abstract of the Reports of Deaths and their Causes in the following Cities and Towns of California during April, 1893.

	Alturas	Alameda	Alameda and vicinity	Anderson	Antioch and vicinity	Arbuckle	Auburn	Azusa and vicinity	Bakersfield and vicinity	Benicia and vicinity	Berkeley	Biggs	Bishop and vicinity	Calico	Callistoga	Carpenteria	Concord	Colton	College City	Cottonwood and vicinity	Cloverdale	Chico and vicinity	Dixon and vicinity	Downey and vicinity	Etna Mills and vicinity	Elk Grove	Eureka and vicinity	El Monte and vicinity	Fresno Flats	Fresno	Folsom	Galt	Grass Valley and vicinity
Other Causes	1	7	—	—	—	—	—	—	—	1	2	7	4	—	—	—	—	1	2	—	1	1	4	—	2	1	1	8	—	4	—	1	3
Alcoholism	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Heart Diseases	—	1	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—	1	—	2	—	1	—	—	—	—	—	—	—
Erysipelas	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cancer	—	—	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
Cerebro - Spinal Fevers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—
Remittent and Intermittent Fevers	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Typhoid Fever	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Typho - Malarial Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Whooping-Cough	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Measles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Scarlet Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Croup	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Diphtheria	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—
Other Diseases of St'mach & Bow'ls	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cholera Infantum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Diarrhœa and Dysentery	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Congestion of the Lungs	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Acute Bronchitis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—
Acute Pneumonia	—	1	—	—	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1	—	—	—
Consumption	—	4	—	—	1	—	—	2	1	—	—	—	—	—	—	1	2	—	—	—	1	4	—	2	1	—	1	—	—	2	—	—	—
Total Deaths	1	14	0	2	3	1	2	3	10	2	7	0	0	0	1	0	4	2	2	0	3	1	10	0	8	4	2	11	0	10	0	1	3
Estimated Population	1,500	12,500	5,000	1,000	3,000	500	1,601	2,500	4,000	3,500	4,000	1,000	1,500	500	600	800	500	2,000	700	1,250	1,500	8,890	2,500	2,500	1,000	500	7,000	1,650	600	10,000	1,960	700	7,000

ABSTRACT FOR APRIL, 1893—Continued.

Other Causes	—	1	4	7	—	1	3	—	3	—	1	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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MAY, 1893.

Reports from 104 cities, towns, villages, and sanitary districts, aggregating a population of 838,384, show a total mortality of 1,016 from all causes in May. This corresponds to a death-rate of 1.21 per 1,000 per month, or 14.52 per annum.

There were 157 deaths due to consumption, 68 to pneumonia, 34 to bronchitis, 8 to congestion of the lungs, 10 to diarrhoea, 6 to dysentery, 9 to cholera infantum, 53 to other diseases of the stomach and bowels, 22 to diphtheria, 11 to croup, 6 to scarlatina, 1 to measles, 1 to smallpox, 3 to whooping-cough, 13 to typhoid fever, 1 to malarial fevers, 16 to cerebro-spinal fever, 39 to cancer, 5 to erysipelas, 91 to diseases of the heart, 4 to alcoholism, and 455 to all other causes. The death from smallpox was in San Francisco.

PREVAILING DISEASES.

Reports of prevailing diseases from 60 towns and villages outside of the larger cities, having an aggregate population of 493,624, give 45 cases of pneumonia, 145 of bronchitis, 20 of pleuritis, 18 of congestion of the lungs, 150 of diarrhoea, 24 of dysentery, 29 of cholera morbus, 19 of cholera infantum, 9 of diphtheria, 15 of croup, 27 of scarlatina, 107 of measles, 1 of smallpox, 85 of whooping-cough, 142 of la grippe, 17 of typhoid fever, 214 of malarial fevers, 3 of cerebro-spinal fever, 24 of erysipelas, 140 of rheumatism, 108 of neuralgia, 110 of tonsilitis, and 70 of pharyngitis.

Measles was reported epidemic at Red Bluff, and whooping-cough at Hollister and Folsom. The case of smallpox reported under this head was in Fresno; the patient was isolated, made good recovery, and no further trouble is apprehended from that source.

[illegible]

JUNE, 1893.

Reports from 97 cities, towns, villages, and sanitary districts, aggregating a population of 826,794, show a mortality of 961 from all causes in June. This corresponds to a death-rate of 1.16 per 1,000 per month, or 13.92 per annum.

There were 146 deaths due to consumption, 67 to pneumonia, 23 to bronchitis, 2 to congestion of the lungs, 15 to diarrhœa and dysentery, 23 to cholera infantum, 64 to other diseases of the stomach and bowels, 10 to diphtheria, 4 to croup, 7 to scarlatina, 1 to measles, 4 to whooping-cough, 35 to typhoid fever, 4 to malarial fevers, 8 to cerebro-spinal fever, 29 to cancer, 1 to erysipelas, 71 to diseases of the heart, 8 to alcoholism, and 439 to all other causes.

PREVAILING DISEASES.

Reports of prevailing diseases from 63 towns and villages outside the larger cities, give 28 cases of pneumonia, 99 of bronchitis, 22 of pleuritis, 10 of congestion of the lungs, 268 of diarrhœa, 69 of dysentery, 58 of cholera morbus, 42 of cholera infantum, 35 of diphtheria, 6 of croup, 28 of scarlatina, 44 of measles, 79 of whooping-cough, 98 of la grippe, 93 of typhoid fever, 268 of malarial fevers, 1 of cerebro-spinal fever, 34 of erysipelas, 129 of rheumatism, 104 of neuralgia, 98 of tonsilitis, and 51 of pharyngitis.

Measles was reported epidemic at Biggs and Elk Grove, and whooping-cough at Merced. One observer reported 15 cases of enteritis.

Abstract of the Reports of Deaths and their Causes in the following Cities and Towns of California during June, 1893.

Other Causes	3	1	1	1	2	7	1	3	4	1	1	1	3	5	3	1	3
Alcoholism	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Heart Diseases	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1
Erysipelas	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cancer	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cerebro - Spinal Fevers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Remittent and Intermittent Fevers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Typhoid Fever	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1
Typho - Malarial Fever	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Whooping-Cough	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Smallpox	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Measles	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Scarlet Fever	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Croup	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Diphtheria	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Other Diseases of St'mach & Bow'ls	3	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1
Cholera Infantum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Diarrhoea and Dysentery	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1
Congestion of the Lungs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Acute Bronchitis	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Acute Pneumonia	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1
Consumption	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1
Total Deaths	0	19	4	2	4	13	2	1	8	1	1	1	3	12	0	6	0
Estimated Population	1,500	13,500	5,000	800	3,000	1,601	3,500	4,800	8,800	1,000	2,500	1,000	2,500	1,650	1,000	500	7,000
	Alturas	Alameda	Anaheim and vicinity	Anderson	Antioch and vicinity	Auburn	Azusa and vicinity	Bakersfield	Benicia	Bishop and vicinity	Calico	Calistoga	Carpenteria	Colton and vicinity	Concord	Cottonwood	Cloverdale
	Chico and vicinity	Davisville	Dixon and vicinity	Downieville and vicinity	Downey and vicinity	El Monte and vicinity	Etna Mills and vicinity	Elk Grove	Eureka	Elsinore and vicinity	Fort Bidwell and vicinity	Fresno	Folsom	Galt	Grass Valley	Gridley	

[illegible]

JULY, 1893.

Reports from 96 cities, towns, villages, and sanitary districts, aggregating a population of 824,150, show a total mortality of 988 from all causes in the month of July. This corresponds to a death-rate of 1.198 per month, or 14.376 per annum.

There were 138 deaths due to consumption, 45 to pneumonia, 15 to bronchitis, 6 to congestion of the lungs, 21 to diarrhœa and dysentery, 36 to cholera infantum, 83 to other diseases of the stomach and bowels, 16 to diphtheria, 6 to croup, 1 to scarlatina, 2 to measles, 11 to whooping-cough, 58 to typhoid fever, 9 to malarial fevers, 5 to cerebro-spinal fever, 31 to cancer, 2 to erysipelas, 72 to diseases of the heart, 8 to alcoholism, and 423 to all other causes.

PREVAILING DISEASES.

Reports of prevailing diseases from 60 towns, villages, and sanitary districts outside of the larger cities, give 23 cases of pneumonia, 62 of bronchitis, 20 of pleuritis, 18 of congestion of the lungs, 272 of diarrhœa, 65 of dysentery, 89 of cholera morbus, 54 of cholera infantum, 4 of diphtheria, 14 of croup, 17 of scarlatina, 49 of measles, 63 of whooping-cough, 18 of la grippe, 56 of typhoid fever, 244 of malarial fevers, 8 of cerebro-spinal fever, 15 of erysipelas, 90 of rheumatism, 71 of neuralgia, 98 of tonsilitis, and 24 of pharyngitis.

AUGUST, 1893.

Reports from 103 cities, towns, villages, and sanitary districts, aggregating a population of 761,810, show a total mortality of 873 from all causes during the month of August. This corresponds to a death-rate of 1.14 per month, or 13.68 per annum.

There were 213 deaths due to consumption, 57 to pneumonia, 16 to bronchitis, 8 to congestion of the lungs, 16 to diarrhoea and dysentery, 37 to cholera infantum, 72 to other diseases of the stomach and bowels, 6 to diphtheria, 5 to croup, 3 to whooping-cough, 33 to typhoid fever, 6 to malarial fevers, 2 to cerebro-spinal fever, 27 to cancer, 7 to erysipelas, 67 to diseases of the heart, 5 to alcoholism, and 363 to all other causes.

PREVAILING DISEASES.

Reports of prevailing diseases from 70 towns, villages, and sanitary districts outside of the larger cities, give 26 cases of pneumonia, 84 of bronchitis, 34 of pleuritis, 7 of congestion of the lungs, 164 of diarrhoea, 91 of dysentery, 57 of cholera morbus, 67 of cholera infantum, 28 of diphtheria, 3 of croup, 22 of scarlatina, 31 of measles, 38 of whooping-cough, 25 of la grippe, 102 of typhoid fever, 305 of malarial fevers, 7 of cerebro-spinal fever, 38 of erysipelas, 110 of rheumatism, 68 of neuralgia, 86 of tonsilitis, and 38 of pharyngitis.

The entire State is in a healthy condition, and public sentiment seems to be in favor of public cleanliness, which leads to public health. This is manifested in movements by municipalities toward the construction of much-needed systems of sewers, the erection of garbage crematories, and the procurement of better water supplies.

We are again called upon to congratulate the health authorities for stamping out Asiatic cholera at Jersey City during August. Lateness of the season makes it reasonably certain that another year must elapse before we are again threatened. Nothing can be more certain than that the very extensive and thorough precautions taken by our Government in preventing its entry have proved effective during the summer; but the incident at Jersey City shows the danger of permitting, by municipal authority, the landing of a cargo of fruit from an infected ship coming from an infected port.

Abstract of the Reports of Deaths and their Causes in the following Cities and Towns of California during August, 1893.

	Other Causes	Alcoholism	Heart Diseases	Erysipelas	Cancer	Cerebro-Spinal Fevers	Remittent and Intermittent Fevers	Typhoid Fever	Typho-Malarial Fever	Whooping-Cough	Smallpox	Measles	Scarlet Fever	Croup	Diphtheria	Other Diseases of St'mach & Bow'ls	Cholera Infantum	Diarrhoea and Dysentery	Congestion of the Lungs	Acute Bronchitis	Acute Pneumonia	Consumption	Total Deaths	Estimated Population
Alameda	2																		1	1	3	18	13,500	
Antioch and vicinity	1																						0	3,000
Auburn	1																						1	1,601
Azusa and vicinity																						1	6	2,500
Benicia and vicinity																						1	5	3,000
Berkeley																						1	7	5,100
Biggs																						1	0	1,000
Bishop and vicinity																							0	1,500
Calico																							0	500
Calistoga																						1	1	600
Colton and vicinity																							1	2,000
Concord																							0	500
Cloverdale																							1	1,500
Chico and vicinity																						2	11	8,890
Dixon and vicinity																						2	2	2,500
Downieville and vicinity																						0	0	1,000
Downey and vicinity																						3	3	2,500
Etna Mills and vicinity																						1	1	1,000
Elk Grove																						2	2	500
Eureka and vicinity																						7	7	10,000
Elsinore																						0	0	800
Fort Bidwell and vicinity																						10	10	1,500
Fresno																						1	1	10,000
Fresno Flats																						1	1	600
Folsom																						1	1	1,900
Galt																						3	3	700
Grass Valley and vicinity																						0	0	7,000
Gilroy																						2	2	2,000
Gonzales																						1	1	350
Gridley and vicinity																						2	2	1,500
Haywards																						5	5	3,500
Ione and vicinity																						3	3	1,800
Knights Ferry and vicinity																						1	1	1,500

ABSTRACT FOR AUGUST, 1893—Continued.

Other Causes	7	1	2	1	12	1	1	1	3	4	1	3	1	1	1	343
Alcoholism	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5
Heart Diseases	1	1	—	—	2	—	—	—	1	—	1	—	—	—	—	67
Erysipelas	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	7
Cancer	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	27
Cerebro - Spinal Fevers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
Remittent and Intermittent Fevers	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	6
Typhoid Fever	2	—	1	—	—	—	—	—	—	—	1	—	—	—	—	33
Typho - Malarial Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Whooping-Cough	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Measles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Scarlet Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Croup	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5
Diphtheria	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6
Other Diseases of St'mach & Bow'ls	—	—	1	—	—	—	1	—	—	—	1	—	—	—	—	72
Cholera Infantum	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	37
Diarrhœa and Dysentery	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16
Congestion of the Lungs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8
Acute Bronchitis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16
Acute Pneumonia	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	57
Consumption	—	—	—	1	4	—	—	—	—	—	—	—	—	—	—	213
Total Deaths	9	5	1	5	19	0	1	1	5	5	4	5	0	0	0	873
Estimated Population	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Santa Cruz and vicinity	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Santa Rosa	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Santa Maria	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Sausalito	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Selma and vicinity	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Sierra Valley	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Sisson	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Stockton	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Solano County, District No. 2	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Susanville	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Soquel	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Smartsville	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Truckee and vicinity	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Trinity County	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Tulare City	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Upper Lake	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Vallejo	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Ventura and vicinity	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Vacaville and Elmira	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Watsonville and vicinity	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Wheatland	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Winters and vicinity	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Weaverville	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Williams	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Woodbridge	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Woodland	12,000	5,216	1,000	1,200	3,000	1,000	1,000	17,000	2,000	850	240	1,500	1,300	5,000	2,000	761,810
Totals	9	5	1	5	19	0	1	1	5	5	4	5	0	0	0	873

SEPTEMBER, 1893.

Reports from 90 cities, towns, villages, and sanitary districts, aggregating a population of 734,180, show a total mortality of 898 from all causes during the month of September. This corresponds to a death-rate of 1.28 per month, or 14.64 per annum.

There were 140 deaths due to consumption, 46 to acute pneumonia, 23 to acute bronchitis, 12 to congestion of the lungs, 18 to diarrhoea and dysentery, 24 to cholera infantum, 76 to other diseases of the stomach and bowels, 12 to diphtheria, 1 to croup, 1 to measles, 2 to whooping-cough, 32 to typhoid fever, 6 to malarial fevers, 4 to cerebro-spinal fever, 32 to cancer, 74 to diseases of the heart, 7 to alcoholism, and 388 to all other causes.

Los Angeles reports 5 deaths from typhus fever. Up to this time it was not generally known that this extremely contagious disease had obtained a foothold in California. There was one death from leprosy at Downieville.

PREVAILING DISEASES.

Reports of prevailing diseases from 57 towns, villages, and sanitary districts outside of the larger towns, give 23 cases of pneumonia, 112 of bronchitis, 32 of pleurisy, 16 of congestion of the lungs, 258 of diarrhoea, 59 of dysentery, 42 of cholera morbus, 43 of cholera infantum, 18 of diphtheria, 15 of croup, 14 of scarlatina, 12 of measles, 16 of whooping-cough, 13 of la grippe, 98 of typhoid fever, 369 of malarial fevers, four of cerebro-spinal fever, 18 of erysipelas, 123 of neuralgia, 95 of rheumatism, and 135 of tonsillitis and pharyngitis.

La grippe has made its appearance quite early in the season. That it has not produced fatalities is not so much due to the mildness of the epidemic as to the unirritating condition of the weather.

Knights Ferry.....	1,500	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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OCTOBER, 1893.

Reports from 83 cities, towns, villages, and sanitary districts, aggregating a population of 784,457, show a total mortality of 987 from all causes during the month of October. This corresponds to a death-rate of 1.25 per 1,000 per month, or 15.00 per 1,000 per annum.

There were 142 deaths due to consumption, 86 to pneumonia, 28 to bronchitis, 8 to congestion of the lungs, 10 to diarrhoea and dysentery, 23 to cholera infantum, 67 to other diseases of the stomach and bowels, 13 to diphtheria, 5 to croup, 1 to scarlatina, 2 to whooping-cough, 31 to typhoid fever, 11 to malarial fevers, 5 to cerebro-spinal fever, 31 to cancer, 1 to erysipelas, 75 to heart diseases, 11 to alcoholism, and 437 to all other causes.

PREVAILING DISEASES.

Reports of prevailing diseases from 51 villages, towns, and sanitary districts outside of the larger cities, give 65 cases of pneumonia, 137 of bronchitis, 34 of pleurisy, 17 of congestion of the lungs, 174 of diarrhoea, 28 of dysentery, 20 of cholera morbus, 32 of cholera infantum, 43 of diphtheria, 30 of croup, 14 of scarlatina, 3 of measles, 15 of whooping-cough, 495 of influenza, 44 of typhoid fever, 293 of malarial fevers, 3 of cerebro-spinal fever, 19 of erysipelas, 96 of rheumatism, 103 of neuralgia, 137 of tonsilitis, 61 of pharyngitis, and 10 of chickenpox.

The Health Officer of Los Angeles desires to correct his report of 5 deaths from typhus fever in that city during September. The deaths should have been reported as due to typhoid fever.

Abstract of the Reports of Deaths and their Causes in the following Cities and Towns of California during October, 1893.

[illegible]

[illegible]

ABSTRACT FOR OCTOBER, 1893—Continued.

Other Causes	1	—	—	1	437
Alcoholism	—	1	—	—	11
Heart Diseases	1	1	—	1	75
Erysipelas	—	—	—	—	1
Cancer	—	—	—	—	31
Cerebro - Spinal Fevers	2	1	—	—	5
Remittent and Intermittent Fevers	—	—	—	—	11
Typhoid Fever	—	—	—	—	31
Typho - Malarial Fever	—	—	—	—	—
Whooping-Cough	—	—	—	—	2
Smallpox	—	—	—	—	0
Measles	—	—	—	—	0
Scarlet Fever	—	—	—	—	1
Croup	—	—	1	—	5
Diphtheria	—	—	—	—	13
Other Diseases of St'mach & Bow'ls	—	—	—	—	67
Cholera Infantum	—	—	—	—	23
Diarrhœa and Dysentery	—	—	—	—	10
Congestion of the Lungs	—	—	—	—	8
Acute Bronchitis	—	—	—	—	28
Acute Pneumonia	2	1	—	—	86
Consumption	1	—	—	3	142
Total Deaths	7	4	0	5	987
Estimated Population	3,000	1,000	1,300	300	784,457
	3,500				
Watsonville and vicinity					
Wheatland					
Weaverville					
Woodbridge					
Woodland					
Totals					

NOVEMBER, 1893.

Reports from 92 cities, towns, villages, and sanitary districts, aggregating a population of 808,049, show a total mortality of 1,098 from all causes during the month of November. This corresponds to a death-rate of 1.35 per 1,000 per month, or 16.20 per 1,000 per annum.

There were 169 deaths due to consumption, 105 to pneumonia, 49 to bronchitis, 11 to congestion of the lungs, 10 to diarrhoea and dysentery, 15 to cholera infantum, 92 to other diseases of the stomach and bowels, 13 to diphtheria, 3 to croup, 1 to scarlatina, 1 to measles, 7 to whooping-cough, 30 to typhoid fever, 6 to remittent and intermittent fevers, 1 to cerebro-spinal fever, 28 to cancer, 2 to erysipelas, 80 to diseases of the heart, 9 to alcoholism, and 466 to other causes, 10 being from la grippe.

PREVAILING DISEASES.

Reports of prevailing diseases from 67 villages, towns, and sanitary districts outside of the larger cities, give 167 cases of pneumonia, 290 of bronchitis, 68 of pleurisy, 39 of congestion of the lungs, 159 of diarrhoea, 22 of dysentery, 20 of cholera morbus, 16 of cholera infantum, 32 of diphtheria, 27 of croup, 20 of scarlatina, 27 of measles, 37 of whooping-cough, 822 of influenza, 59 of typhoid fever, 179 of malarial fevers, 2 of cerebro-spinal fever, 33 of erysipelas, 147 of rheumatism, 153 of neuralgia, 188 of tonsilitis, 116 of pharyngitis, and 4 of chickenpox.

La grippe is generally prevalent over the area reported from.

CORRECTED REPORTS.

This report, especially from the principal cities and towns in the State, is made from corrected reports for the month of November. Letters have been sent to nearly all of the Health Officers of the principal places, and replies have been received justifying the figures herein given. It is earnestly desired that the estimated population of each town be given in figures by the local Health Officer on his report blank each month, so that if a question should arise, the report can be produced with the original figures upon it. There is no desire on the part of the State Board of Health to minimize the population of any town or city, but it is anxious to obtain, as nearly as possible, the exact population of each place or district reported from.

DANGER FROM SMALLPOX.

Reports from some Eastern and Middle States show that smallpox is epidemic in certain localities. In some places it has produced frightful ravages, and there seems to be no diminution in its prevalence, notwithstanding that most stringent measures have been taken in limiting its spread. In view of the fact that in a few weeks California will receive several thousand visitors from different parts of the Union, it would be well to advise vaccination of all those who are unprotected, and a revaccination of all those who have not been vaccinated during recent years. Nothing could be more injurious to California during the winter than an epidemic of smallpox. It should be urged upon the people that nothing will limit its spread but vaccination.

Abstract of the Reports of Deaths and their Causes in the following Cities and Towns of California during November, 1893.

	Other Causes	Alcoholism	Heart Diseases	Erysipelas	Cancer	Cerebro - Spinal Fevers	Remittent and Intermittent Fevers	Typhoid Fever	Typho - Malarial Fever	Whooping-Cough	Smallpox	Measles	Scarlet Fever	Croup	Diphtheria	Other Diseases of St'mach & Bow'ls	Cholera Infantum	Diarrhœa and Dysentery	Congestion of the Lungs	Acute Bronchitis	Acute Pneumonia	Consumption	Total Deaths	Estimated Population	
Alameda	5	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	15	13,500	Alameda
Anaheim and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5,000	Anaheim
Anderson	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	850	Anderson
Arbuckle	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	500	Arbuckle
Auburn	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1,601	Auburn
Azusa and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2,300	Azusa and vicinity
Bakersfield and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	6	4,800	Bakersfield and vicinity
Benicia and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	3,000	Benicia and vicinity
Berkeley	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	10,000	Berkeley
Biggs and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1,000	Biggs and vicinity
Bishop and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1,500	Bishop and vicinity
Calico and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	500	Calico and vicinity
Concord	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	500	Concord
Colton and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	4	2,000	Colton and vicinity
College City	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	500	College City
Cottonwood and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1,250	Cottonwood and vicinity
Cloverdale	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	5	1,200	Cloverdale
Chico and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9	9	8,890	Chico and vicinity
Davisville	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,000	Davisville
Dixon and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2,500	Dixon and vicinity
Downey and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	800	Downey and vicinity
Downey and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	2,500	Downey and vicinity
Etna Mills and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1,000	Etna Mills and vicinity
El Monte and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	6	2,000	El Monte and vicinity
Elk Grove	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	500	Elk Grove
Eureka and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13	13	7,800	Eureka and vicinity
Fort Bidwell and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1,500	Fort Bidwell and vicinity
Fresno	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	15	10,000	Fresno
Fresno Flats	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	600	Fresno Flats
Folsom	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1,900	Folsom
Galt	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	700	Galt
Grass Valley and vicinity	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	11	11	7,000	Grass Valley and vicinity
Gillroy	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	5	2,000	Gillroy

[illegible]

ABSTRACT FOR NOVEMBER, 1893—Continued.

Other Causes	17	1	2	3	1	1	1	1	465						
Alcoholism	1	1	1	1	1	1	1	1	9						
Heart Diseases	1	1	1	2	1	1	1	1	80						
Erysipelas	1	1	1	1	1	1	1	1	2						
Cancer	1	1	1	1	1	1	1	1	23						
Cerebro - Spinal Fevers	1	1	1	1	1	1	1	1	1						
Remittent and Intermittent Fevers	1	1	1	1	1	1	1	1	6						
Typhoid Fever	1	1	1	1	1	1	1	1	30						
Typho - Malarial Fever	1	1	1	1	1	1	1	1	7						
Whooping-Cough	1	1	1	1	1	1	1	1	0						
Smallpox	1	1	1	1	1	1	1	1	1						
Measles	1	1	1	1	1	1	1	1	1						
Scarlet Fever	1	1	1	1	1	1	1	1	3						
Croup	1	1	1	1	1	1	1	1	13						
Diphtheria	1	1	1	1	1	1	1	1	92						
Other Diseases of St'mach & Bow'ls	3	1	1	1	1	1	1	1	15						
Cholera Infantum	1	1	1	1	1	1	1	1	10						
Diarrhœa and Dysentery	1	1	1	1	1	1	1	1	11						
Congestion of the Lungs	1	1	1	1	1	1	1	1	49						
Acute Bronchitis	1	1	1	1	1	1	1	1	105						
Acute Pneumonia	6	3	1	1	1	1	1	1	169						
Consumption	5	1	1	1	1	1	1	1	1,098						
Total Deaths	33	0	3	4	8	2	2	0	808,049						
Estimated Population	17,000	2,000	850	350	1,300	5,000	300	6,000	808,049						
	Stockton	St. Helena and vicinity	Susanville	Tehama	Truckee and vicinity	Trinity County	Upper Lake	Vallejo	Yacaville and vicinity	Watsonville and vicinity	Winters and vicinity	Williams	Woodbridge	Woodland	Totals

DECEMBER, 1893.

Reports from 90 cities, towns, villages, and sanitary districts, aggregating a population of 814,739, show a mortality of 1,105 from all causes during the month of December. This corresponds to a death-rate of 1.35 per 1,000, or 16.20 per 1,000 per annum.

There were 161 deaths due to consumption, 112 to pneumonia, 46 to bronchitis, 11 to congestion of the lungs, 10 to diarrhoea and dysentery, 6 to cholera infantum, 56 to other diseases of the stomach and bowels, 24 to diphtheria, 4 to croup, 4 to scarlatina, 5 to whooping-cough, 33 to typhoid fever, 4 to malarial fevers, 6 to cerebro-spinal fever, 30 to cancer, 5 to erysipelas, 96 to diseases of the heart, 13 to alcoholism, 479 to all other causes, 30 being from la grippe, the mortality from that cause having increased from 10 in November to 30 in December.

PREVAILING DISEASES.

Reports of prevailing diseases from 65 villages, towns, and sanitary districts outside of the larger cities, give 105 cases of pneumonia, 206 of bronchitis, 54 of pleurisy, 29 of congestion of the lungs, 132 of diarrhoea, 38 of dysentery, 5 of cholera morbus, 6 of cholera infantum, 27 of diphtheria, 30 of croup, 18 of scarlatina, 20 of measles, 39 of whooping-cough, 637 of influenza, 73 of typhoid fever, 196 of malarial fevers, 11 of cerebro-spinal fever, 34 of erysipelas, 134 of rheumatism, 107 of neuralgia, 110 of tonsilitis, 97 of pharyngitis, and 10 of rubeola.

Measles was epidemic at Bishop, and whooping-cough at Anaheim and Cloverdale. La grippe is more or less prevalent over the entire area of the State.

[illegible]

JANUARY, 1894.

Reports from 97 cities, towns, villages, and sanitary districts, aggregating a population of 831,551, show a mortality of 1,234, or a death-rate of 1.48 per 1,000 for January, or 17.76 per 1,000 per annum.

There were 209 deaths from consumption, 113 from pneumonia, 44 from acute bronchitis, 9 from congestion of the lungs, 1 from diarrhoea, 2 from cholera infantum, 68 from other diseases of the stomach and bowels, 19 from diphtheria, 10 from croup, 14 from whooping-cough, 28 from typhoid fever, 4 from malarial fevers, 37 from cancer, 5 from erysipelas, 115 from diseases of the heart, 7 from alcoholism, 549 from other causes, 19 of which were from la grippe.

PREVAILING DISEASES.

Reports of prevailing diseases from 60 localities outside of the larger towns and cities, give 114 cases of pneumonia, 203 of bronchitis, 47 of pleurisy, 23 of congestion of the lungs, 83 of diarrhoea, 21 of dysentery, 8 of cholera morbus, 11 of cholera infantum, 17 of diphtheria, 36 of croup, 7 of scarlatina, 63 of measles, 81 of whooping-cough, 571 of la grippe, 34 of typhoid fever, 116 of malarial fevers, 4 of cerebro-spinal fever, 36 of erysipelas, 153 of rheumatism, 159 of neuralgia, 104 of tonsilitis, and 75 of pharyngitis.

Measles was epidemic at Elkhorn, Mariposa County. Whooping-cough was epidemic at Cloverdale, College City, and Anaheim. The fatality from this disease of childhood during the month of January was large, 14 having died from that cause. Chickenpox is epidemic at Anaheim.

SMALLPOX IN THE EAST.

This disease is reported as prevailing quite generally in the East, the numbers in the aggregate reaching high figures. The western limit by last report is the State of Iowa.

It may not be amiss to again urge a revival of vaccination. Smallpox in any household is as disastrous as a fire. City and town authorities should provide free vaccination for all who will avail themselves of it, without waiting for an announcement of the unwelcome advent of the disease.

STATE SANITARY CONVENTION.

The second annual State Sanitary Convention will be held at San José on the afternoon and evening of Monday, April 16th, in the hall to be occupied on the following day by the State Medical Society. The convention will be held under the auspices of the State Board of Health, which will provide for the necessary expenses. The invitation is extended to all medical men, Boards of Health, city and sanitary engineers, clergymen, and all others who take an active interest in preventive measures against disease. As announced in a circular letter in December, the following resolution will be introduced:

"Resolved, That hereafter consumption (and other diseases due to the *Bacillus tuberculosis*) should be included in the list of diseases dangerous to the public health, requiring notice by householders and physicians to the local Health Officer, as soon as recognized."

It is confidently expected that this subject will be ably discussed. Short papers are solicited on any branch of sanitary science, those having a local bearing being especially desirable. These papers, with all the proceedings of the convention, will be published in pamphlet form for general distribution. The titles of papers should be forwarded early to facilitate the completion of a suitable programme. A circular letter has been sent to a large number, but as it may not reach all who might wish to take part, a general invitation is extended, and papers on the subjects suggested earnestly solicited.

[illegible]

ABSTRACT FOR JANUARY, 1894—Continued.

Other Causes	2	1	8	3	1	2	1	4	1	5	5	1	1	4	549
Alcoholism	—	—	—	1	—	—	—	1	—	—	—	—	—	—	7
Heart Diseases	1	—	2	—	—	—	—	1	—	—	1	—	—	1	115
Erysipelas	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5
Cancer	—	—	—	—	—	—	—	—	—	—	—	—	—	—	37
Cerebro - Spinal Fevers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Remittent and Intermittent Fevers	—	—	1	—	—	—	—	—	1	—	—	—	—	—	4
Typhoid Fever	—	—	—	—	—	—	—	—	1	—	—	—	—	—	28
Typho - Malarial Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Whooping-Cough	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14
Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Measles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Scarlet Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Croup	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10
Diphtheria	—	—	1	—	—	—	—	—	—	—	—	—	—	—	19
Other Diseases of St'mach & Bow'ls	—	—	—	—	—	—	—	1	—	—	1	—	—	—	68
Cholera Infantum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
Diarrhoea and Dysentery	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Congestion of the Lungs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9
Acute Bronchitis	—	—	—	3	—	—	—	—	—	—	—	—	—	—	44
Acute Pneumonia	—	—	—	1	—	—	—	1	—	3	—	—	—	—	113
Consumption	—	—	1	2	—	—	—	1	1	2	—	2	—	—	209
Total Deaths	1	2	2	18	4	1	0	2	2	6	11	7	3	4	1,234
Estimated Population	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Solano County, District No. 2	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Sutter County	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Selma and vicinity	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Stockton	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
St. Helena and vicinity	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Susana	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Soquel	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Tehama	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Truckee and vicinity	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Trinity County	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Tulare City	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Upper Lake	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Vallejo	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Ventura and vicinity	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Vacaville and vicinity	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Watsonville and vicinity	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Williams	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Woodbridge	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Woodland	2,000	5,489	3,000	17,000	2,000	850	250	300	1,300	5,000	4,000	300	6,000	7,000	831,551
Totals	1,234	209	113	44	9	1	2	68	19	10	0	0	0	14	549

FEBRUARY, 1894.

Reports from 89 cities, towns, villages, and sanitary districts, aggregating a population of 810,140, show a mortality of 1,011, or a death-rate of 1.24 per 1,000 for February, or 14.88 per 1,000 per annum.

There were 205 deaths from consumption, 98 from pneumonia, 31 from bronchitis, 10 from congestion of the lungs, 2 from diarrhoea, 4 from cholera infantum, 52 from other diseases of the stomach and bowels, 9 from diphtheria, 7 from croup, 4 from scarlet fever, 7 from whooping-cough, 14 from typhoid fever, 1 from malarial fevers, 5 from cerebro-spinal fever, 25 from cancer, 2 from erysipelas, 86 from diseases of the heart, 4 from alcoholism, and 445 from other causes, 8 of which were from la grippe.

PREVAILING DISEASES.

Reports of prevailing diseases from 57 localities outside of the larger towns and cities, give 123 cases of pneumonia, 193 of bronchitis, 51 of pleurisy, 30 of congestion of the lungs, 66 of diarrhoea, 27 of dysentery, 6 of cholera morbus, 6 of cholera infantum, 18 of diphtheria, 29 of croup, 31 of scarlatina, 85 of measles, 52 of whooping-cough, 407 of la grippe, 34 of typhoid fever, 117 of malarial fevers, 7 of cerebro-spinal fever, 25 of erysipelas, 132 of rheumatism, 79 of neuralgia, 147 of tonsilitis, and 92 of pharyngitis.

Measles was epidemic at Fresno Flats. Whooping-cough was epidemic at Arbuckle, Anaheim, and Elk Grove. Chicken-pox is epidemic at Vacaville and Elmira.

STATE SANITARY CONVENTION.

As previously announced, the second annual State Sanitary Convention will be held at San José on Monday, April 16th, under the auspices of the State Board of Health. A sufficient number of papers on topics relating to preventive medicine have been promised to insure a meeting of more than ordinary interest. The invitation to attend is extended to all medical men and others interested in the subject. Those having papers to present are requested to forward the title to the Secretary of the State Board of Health, so that a programme may be completed at an early date. The State Board will defray the incidental expenses of the meeting and publish the proceedings, with the papers, for general distribution. Such conventions are being held in most of the progressive States of the Union, and California may indulge in a pardonable pride at the result of her first venture in this direction, in 1893. There is reason for the prediction that the second annual convention will in no way be eclipsed by the first, and as the published proceedings must, in a measure, be regarded as an index of the standard of our aims, if not of our achievements, in the direction of State or preventive medicine, our local pride should be enlisted to give vigor and vitality to our voices in expressing our convictions on the subjects that shall properly come before us.

[illegible]

MARCH, 1894.

Reports from 88 cities, towns, villages, and sanitary districts, aggregating a population of 773,287, show a mortality of 1,074—a death-rate of 1.38 per 1,000 for March, or 16.56 per 1,000 per annum.

There were 193 deaths from consumption, 111 from pneumonia, 37 from bronchitis, 9 from congestion of the lungs, 2 from diarrhoea, 1 from cholera infantum, 57 from other diseases of the stomach and bowels, 7 from diphtheria, 7 from croup, 1 from scarlatina, 7 from whooping-cough, 12 from typhoid fever, 2 from malarial fevers, 10 from cerebro-spinal fever, 44 from cancer, 2 from erysipelas, 84 from diseases of the heart, 5 from alcoholism, and 483 from other causes, 11 of which were from la grippe.

PREVAILING DISEASES.

Reports of prevailing diseases from 55 localities outside of the larger towns and cities give 81 cases of pneumonia, 128 of bronchitis, 47 of pleurisy, 22 of congestion of the lungs, 65 of diarrhoea, 17 of dysentery, 6 of cholera morbus, 6 of cholera infantum, 9 of diphtheria, 31 of croup, 13 of scarlatina, 62 of measles, 92 of whooping-cough, 214 of la grippe, 10 of typhoid fever, 92 of malarial fevers, 2 of cerebro-spinal fever, 25 of erysipelas, 122 of rheumatism, 85 of neuralgia, 116 of tonsilitis, and 61 of pharyngitis.

Measles was epidemic at Bishop, Madera, and in Fresno County. Whooping-cough was epidemic at Anaheim, College City, and Gridley. Chickenpox is epidemic at Fresno Flats, Knight's Ferry, Fallbrook, and South Pasadena.

REGISTRY OF BIRTHS, MARRIAGES, AND DEATHS.

The laws of the State with reference to registration of births, marriages, and deaths have, in many counties, been partially or totally ignored. Some counties have regularly returned births and deaths, but none have reported marriages.

There is a penalty of \$50 for failure, neglect, or refusal to perform any of the duties relating to registration. The importance of registration is so evident that it need not be urged. It is the law and should be obeyed. A vigorous effort will be made to enforce the law in every county in California. It is necessary to call upon the public press for assistance in this matter. Without the aid of the press, the general publicity of the laws cannot be made. Neither will the glaring failure, neglect, or refusal of persons to obey the law be much noticed unless the matter is taken up by the press of the State. It is the duty of the District Attorney to prosecute such cases, and in case of his failure to do so, the county Boards of Supervisors must be appealed to. The proper registers of births, marriages, and deaths have been prepared, and have been distributed by the honorable Secretary of State to every county in the State, and no effort in the power of the State Board of Health, or in that of its membership as individuals, will be spared in enforcing a compliance with the law.

The sections of the Political Code relating to registration are hereto appended :

SEC. 3074. All persons who perform the marriage ceremony must keep a registry of the time of each marriage so celebrated, the residence, the names in full, the place of birth, the age of each party, and whether either party has ever been before married. [In effect March 16, 1878.]

SEC. 3075. All physicians and professional midwives must keep a registry of the time of each birth at which they assist professionally, the sex, race, and color of the child, and the names and residence of the parents.

SEC. 3076. Physicians who attend deceased persons in their last sickness, clergymen who officiate at a funeral, Coroners who hold inquests, sextons and undertakers who bury deceased persons, must each keep a registry of the name, age, residence, and time of death of such person. [Approved March 30th; in effect July 6, 1874.]

SEC. 3077. All persons registering marriages, births, or deaths, must quarterly file with the County Recorder a certified copy of their register. All such certificates must specify, as near as may be ascertained, the name in full, age, occupation, term of residence in the city or county, birthplace, condition (whether single or married, widow or widower), sex, race, color, last place of residence, and cause of death of all decedents. [In effect March 16, 1878.]

SEC. 3078. If at birth no physician or midwife attend, then the parents must make the report.

SEC. 3079. The Recorder must keep separate registers, to be known as the "Register of Marriages," the "Register of Births," and the "Register of Deaths," in which the marriages, births, and deaths certified to him must be numbered in the order in which they are reported to him. There must be stated in each register, in separate columns, properly headed, the various facts contained in the certificates, and the name and official or clerical position of the person making the report. The Recorder must carefully examine each report, and register the same marriage, birth, or death but once, although it may be reported by different persons. [In effect March 16, 1878.]

SEC. 3080. The County Recorder must, every three months, transmit to the Secretary of the State Board of Health, at Sacramento City, a certified abstract of the registers of births, marriages, and deaths, prepared in the manner prescribed in the instructions of the Secretary, and upon the blanks to be furnished by him for that purpose.

SEC. 3081. County Recorders, in those counties where their compensation is by fees, shall be allowed by the Board of Supervisors a fee of not exceeding ten cents for each

name reported, to be paid out of the General Fund of the county; and in those counties where their compensation is by a fixed salary, the duties in this chapter provided shall be performed without compensation other than such salary. [In effect March 16, 1878.]

Sec. 3082. Any person on whom a duty is imposed by this chapter, who fails, neglects, or refuses to perform the same as herein required, is liable to a penalty of fifty dollars, to be recovered by the District Attorney of the proper county, for the use of the General Fund of such county.

Sec. 3083. The Secretary of the State Board of Health must prepare blank forms of said registers for the State Printer, who must print as many copies as the said Secretary shall direct, and deliver the same to the Secretary of State, who shall forward the same, from time to time, and in such numbers as shall be directed by the Secretary first mentioned, to the County Recorders of the several counties, who must carefully keep and distribute the same to the persons in the county who are required to keep the registers and make the reports provided in this chapter. [In effect March 16, 1878.]

Sec. 3084. No person shall inter, cremate, or otherwise dispose of any human body, in any city, county, or city and county, without first having obtained a permit therefor. In incorporated cities, or counties, or cities and counties, the permit must be obtained from the person authorized to grant the same by any law, ordinance, or resolution passed for that purpose. But in the absence of such law, ordinance, or resolution, the permit must be obtained from either the Coroner, Health Officer, or Board of Health, or if the Coroner be absent, then from the Health Officer or Board of Health; and if there be no Board of Health or Health Officer, then from a Justice of the Peace. The person applying for a permit must produce and file with the officer issuing the permit a certificate signed by a physician, or a Coroner, or two reputable citizens, setting forth as near as possible the name, age, color, place of birth, occupation, date, locality, and cause of death of deceased. And no permit shall be granted without the production of such certificate. Such permit must be filed with the County Recorder, and the person so filing is entitled to the compensation provided for in section three thousand and seventy-seven of this Code, but if any other registration of the death of the deceased shall have been made, the Recorder must record the name but once. [Approved February 25, 1889; in effect thirty days after.]

Abstract of the Reports of Deaths and their Causes in the following Cities and Towns of California during March, 1894.

[illegible]

ABSTRACT FOR MARCH, 1894—Continued.

	Other Causes	Alcoholism	Heart Diseases	Erysipelas	Cancer	Cerebro - Spinal Fevers	Remittent and Intermittent Fevers	Typhoid Fever	Typho - Malarial Fever	Whooping-Cough	Smallpox	Measles	Scarlet Fever	Croup	Diphtheria	Other Diseases of St'mach & Bow'ls	Cholera Infantum	Diarrhœa and Dysentery	Congestion of the Lungs	Acute Bronchitis	Acute Pneumonia	Consumption	Total Deaths	Estimated Population	
Knights Ferry	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1,500	
Lookeford and vicinity	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	1,200	
Long Beach and vicinity	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	2,000	
Livermore	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	2,500		
Lakeport	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	1,200		
Lodi and vicinity	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2,000		
Los Angeles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	108	65,000	
Marysville	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	4,000		
Merced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	2,000		
Middletown	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	1,000		
Madera	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1,000		
Monterey	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	3,000		
Martinez	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	1,500		
National City	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	1,200		
Nevada City	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	3,500		
Nipomo	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	700		
North Temescal and vicinity	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13	10,000		
Needles and vicinity	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	750		
Oakland	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	54	60,000		
Oroville	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	2,000		
Ontario and vicinity	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	2,500		
Pacific Grove	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	1,500		
South Pasadena	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1,300		
Petaluma and vicinity	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	12,000		
Placerville, S. D. No. 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2,500		
Pomona and vicinity	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	5,000		
Pleasanton	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	2,000		
Redlands and vicinity	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	3,600		
Rio Vista and vicinity	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	1,800		
Sacramento	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
San Bernardino	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17	8,000		
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	18,000		
San Francisco	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	55	565	330,000	

[illegible]

APRIL, 1894.

Reports from 86 cities, towns, villages, and sanitary districts, aggregating a population of 893,453, show a mortality of 1,118—a death-rate of 1.25 per 1,000 for April, or 15.00 per 1,000 per annum.

There were 210 deaths from consumption, 101 from pneumonia, 36 from bronchitis, 14 from congestion of the lungs, 8 from diarrhoea, 8 from cholera infantum, 73 from other diseases of the stomach and bowels, 17 from diphtheria, 6 from croup, 3 from scarlatina, 2 from measles, 7 from whooping-cough, 8 from typhoid fever, 1 from malarial fevers, 10 from cerebro-spinal fever, 31 from cancer, 7 from erysipelas, 96 from diseases of the heart, 6 from alcoholism, and 474 from other causes, 9 of which were from la grippe.

PREVAILING DISEASES.

Reports of prevailing diseases from 55 localities outside of the larger towns and cities give 48 cases of pneumonia, 152 of bronchitis, 45 of pleurisy, 17 of congestion of the lungs, 141 of diarrhoea, 43 of dysentery, 18 of cholera morbus, 9 of cholera infantum, 18 of diphtheria, 25 of croup, 24 of scarlatina, 38 of measles, 115 of whooping-cough, 179 of la grippe, 14 of typhoid fever, 209 of malarial fevers, 4 of cerebro-spinal fever, 25 of erysipelas, 129 of rheumatism, 102 of neuralgia, 152 of tonsilitis, and 75 of pharyngitis.

Measles was epidemic at Bishop and San Rafael. Whooping-cough was epidemic at Cloverdale, College City, Lakeport, and Kelseyville. Chickenpox is epidemic at Knight's Ferry, Cathay's Valley, and at Mount Gaines.

SMALLPOX.

Two cases of smallpox have been reported from Cedarville, Modoc County, and by common report in that remote locality several other cases exist about forty miles from there, with accounts of one death. The authorities at Fort Bidwell and Alturas have ordered vaccine virus, and are prepared to fight the epidemic that is threatened. The necessary quarantine is reported in force. The contagion came by way of Reno, Nevada, across the country to Modoc County, from the East. Having once effected a lodgment in the State, it may not be easily stamped out. Let it again be urged that vaccination is the only protection against smallpox. Sniveling sentimentalists who have in all ages cried out against all progress, argue against vaccination. They should either be silenced or passed in scorn. Human life and the prosperity of families, hamlets, towns, and cities are at stake, and demand prompt and decisive action to prevent fear, panic, death, and loss of trade. Public vaccination should be offered by the authorities of towns and counties.

Abstract of the Reports of Deaths and their Causes in the following Cities and Towns of California during April, 1894.

	Alturas	Alameda	Anaheim and vicinity	Antioch and vicinity	Auburn	Azusa and vicinity	Benicia and vicinity	Berkeley	Bishop and vicinity	Calico and vicinity	Carpenteria	Cedarville	Concord	Colton and vicinity	College City	Cottonwood and vicinity	Cloverdale	Chico and vicinity	Davisville	Dixon and vicinity	Downey and vicinity	Etna Mills	Elk Grove and vicinity	Eureka and vicinity	Fallbrook and vicinity	Fort Bidwell and vicinity	Fresno	Fresno Flats	Folsom	Grass Valley and vicinity	Glenn County, Fifth District	Haywards and vicinity
Estimated Population	1,000	13,500	5,000	3,000	1,500	2,000	3,000	10,000	1,500	500	800	200	1,000	2,500	700	1,250	1,500	8,800	1,000	2,500	800	2,500	1,000	1,000	1,200	1,500	10,000	600	1,900	7,000	2,000	4,500
Total Deaths	0	18	6	5	0	2	3	7	3	1	2	1	3	3	2	2	1	11	2	1	0	1	5	3	0	1	19	2	1	2	0	9
Consumption		2				1	2	1		1					1	1		2	1		4	1		3	1	3		1	1		2	
Acute Pneumonia		1	1	1							1	1		1		1						1	1		1	1				1		
Acute Bronchitis		1	1			1															1					1				1		
Congestion of the Lungs		1				1																									1	
Diarrhoea and Dysentery																															1	
Cholera Infantum			1																												1	
Other Diseases of St'mach & Bow'ls		1			1												1								2							
Diphtheria			1	3		1											3															
Croup																																
Scarlet Fever																																
Measles								1																								
Smallpox																																
Whooping-Cough																																
Typho - Malarial Fever																																
Typhoid Fever			1																													
Remittent and Intermittent Fevers																																
Cerebro - Spinal Fevers							1								1																	
Cancer																							2		1	1						
Erysipelas																																
Heart Diseases		2						1															1									
Alcoholism																							1	1		1						
Other Causes	10	3	1				1	4	2	2	2	1	1	1	1	1	5	1	1	1	1	1	1	7		11		1	1	3		

ABSTRACT FOR APRIL, 1894—Continued.

Other Causes	1	1	1	—	49	—	2	2	2	1	—	2	1	1	1	7	21	1	2	6	—	1	2	4	25	9	216	16	—	—	1		
Alcoholism	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—		
Heart Diseases	—	—	—	1	5	—	1	—	—	—	—	1	1	—	1	1	7	—	1	2	—	1	—	5	1	—	4	52	8	—	—	—	
Erysipelas	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Cancer	—	—	—	—	1	—	—	—	—	1	—	—	—	—	—	—	3	—	1	—	—	—	—	1	—	—	17	4	—	—	—	—	
Cerebro - Spinal Fevers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	2	—	—	—	—	—	—	—	—	—	4	—	2	—	—	—	
Remittent and Intermittent Fevers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Typhoid Fever	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	5	—	—	—	—	—	
Typho - Malarial Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Whooping-Cough	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	6	—	—	—	—	—	
Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Measles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Scarlet Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—
Croup	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—
Diphtheria	—	—	—	—	1	4	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—
Other Diseases of St'mach & Bow'ls	—	—	—	—	1	5	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	5	—	—	38	1	3	—	—	—	—
Cholera Infantum	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Diarrhœa and Dysentery	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—
Congestion of the Lungs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	7	—	—	—	—	—	—
Acute Bronchitis	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	2	—	—	25	—	—	—	—	—	—
Acute Pneumonia	—	—	—	—	12	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	3	61	—	—	—	—	—	—
Consumption	—	—	—	1	19	—	2	—	—	—	—	—	—	—	—	—	5	1	—	—	—	—	—	11	3	—	94	—	—	—	—	—	—
Total Deaths	1	1	1	2	99	0	6	3	1	—	—	—	9	2	14	46	1	2	6	—	—	—	57	11	19	546	33	8	1	1	3	2	
Estimated Population	1,500	2,000	2,500	2,000	65,000	1,200	4,000	2,000	1,000	1,000	1,000	2,500	3,000	7,000	1,200	60,000	2,000	2,500	13,700	1,300	2,000	3,500	1,800	30,000	8,000	18,000	330,000	25,000	4,000	1,240	500	3,800	
	Knights Ferry	Long Beach and vicinity	Livermore and vicinity	Lakeport	Lodi and vicinity	Los Angeles	Lockeford and vicinity	Marysville	Merced	Mariposa	Middletown	Madera and vicinity	Monterey	Napa and vicinity	National City	North Temescal and vicinity	Oakland	Oroville	Ontario and vicinity	Pasadena and vicinity	South Pasadena	Pleasanton and vicinity	Redlands and vicinity	Rio Vista and vicinity	Sacramento	San Bernardino	San Diego	San Francisco	San José	San Luis Obispo	San Pedro	San Pablo	San Rafael

[illegible]

MAY, 1894.

Reports from 78 cities, towns, villages, and sanitary districts, aggregating a population of 772,023, show a mortality of 972, a death-rate of 1.26 per 1,000 for May, or 15.12 per 1,000 per annum.

There were 186 deaths from consumption, 76 from pneumonia, 31 from bronchitis, 9 from congestion of the lungs, 6 from diarrhoea, 13 from cholera infantum, 66 from other diseases of the stomach and bowels, 13 from diphtheria, 6 from croup, 3 from scarlatina, 1 from measles, 2 from smallpox, 7 from whooping-cough, 15 from typhoid fever, 1 from malarial fevers, 5 from cerebro-spinal fever, 35 from cancer, 5 from erysipelas, 77 from diseases of the heart, 9 from alcoholism, 424 from other causes, 3 of which were from la grippe and 1 from leprosy.

As will be seen above, Alturas and Cedarville each had a death from smallpox. The epidemic is under control at those points, however, the people having been quite generally vaccinated. Dr. A. Gibson writes from Cedarville, that 30 miles from that place, in Goose Lake Valley, there are 30 cases, with 2 deaths. He says that it has been called chickenpox, the people fearing injury to their business if the truth were told. If it could be generally understood that thorough vaccination was the only reliable safeguard, such mendacious expedients would be more rare. It is better in every way to make no secret of the presence of smallpox, but to proceed at once to stamp it out by isolation of the sick and a successful vaccination of the well persons in any locality. Any other method of procedure in dealing with smallpox will end in confusion and discomfiture, as the secret cannot be kept any longer than enough time to enable the pestilence to get a headway, as difficult of control as a conflagration.

PREVAILING DISEASES.

Reports from 46 localities outside of the larger cities and towns, give 40 cases of pneumonia, 100 of bronchitis, 26 of pleurisy, 6 of congestion of the lungs, 171 of diarrhoea, 74 of dysentery, 24 of cholera morbus, 34 of cholera infantum, 4 of diphtheria, 8 of croup, 10 of scarlatina, 160 of measles, 55 of smallpox, 38 of whooping-cough, 76 of la grippe, 19 of typhoid fever, 202 of malarial fevers, 10 of cerebro-spinal fever, 21 of erysipelas, 84 of rheumatism, 76 of neuralgia, 67 of tonsillitis, and 84 of pharyngitis.

Measles was epidemic at San Rafael, Anaheim, Long Beach, Santa Rosa, and Berkeley.

Chickenpox is epidemic at San Rafael and North Temescal, Oakland Township.

Mumps are epidemic at Anaheim and St. Helena.

Scarlatina is epidemic at Anaheim.

Whooping-cough, in a mild form, is epidemic at Santa Rosa.

Smallpox is epidemic at Willow Ranch, Cedarville, and in Goose Lake Valley.

Abstract of the Reports of Deaths and their Causes in the following Cities and Towns of California during May, 1894.

Other Causes	1	2	2	1	3	3	1	1	2	1	2	2	3	2	1
Alcoholism	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Heart Diseases	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Erysipelas	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cancer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cerebro - Spinal Fevers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Remittent and Inter-mittent Fevers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Typhoid Fever	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Typho - Malarial Fever	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Whooping-Cough	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Smallpox	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Measles	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Scarlet Fever	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Croup	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Diphtheria	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Other Diseases of Stomach & Bow'ls	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cholera Infantum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Diarrhea and Dysentery	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Congestion of the Lungs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Acute Bronchitis	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Acute Pneumonia	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Consumption	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Deaths	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Estimated Population	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Alturas	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Alameda	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Anaheim and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Antioch and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Arbuckle	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Auburn	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Benicia and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Berkeley	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Bishop and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Calico	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Cedarville	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Colton and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
College City	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Concord	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Cottonwood and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Chico and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Dixon and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Downieville and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Downey and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Etna Mills and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
El Monte and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Elk Grove	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Eureka and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Fallbrook and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Fort Bidwell and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Fresno	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Fresno Flats	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Polsom	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Glenn County, 5th District	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Grass Valley and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Hilllands	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Kelseyville and vicinity	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500
Knights Ferry	1,000	14,000	5,000	3,000	500	1,500	3,500	10,000	1,500	500	500	2,500	700	1,000	2,500

Other Causes	2	1	1	2	30	2	2	2	3	3	3	3	3	19	1	2	2	—	—	30	6	10	220	16	5	1	—	3	5	—			
Alcoholism	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—			
Heart Diseases	—	—	1	8	—	—	—	1	2	—	8	1	1	—	—	—	—	1	2	—	1	36	1	2	—	—	1	—	—	—			
Erysipelas	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—			
Cancer	—	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	1	—	1	—	21	—	—	—	—	—	1	—	—			
Cerebro - Spinal Fevers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1			
Remittent and Intermittent Fevers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—			
Typhoid Fever	—	—	—	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	1	9	—	—	—	—	—	1	—	—			
Typho - Malarial Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Whooping-Cough	—	—	—	—	—	—	—	—	—	1	3	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—			
Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Measles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—			
Scarlet Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3	—	—	—	—	—	—	—	—			
Croup	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3	—	—	—	—	—	—	—	—			
Diphtheria	—	—	—	3	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	8	—	—	—	—	—	—	—	—	—			
Other Diseases of St'mach & Bow'ls	—	—	—	1	8	—	—	—	—	2	7	—	—	—	—	—	—	—	—	2	33	1	2	—	—	1	—	—	—	—			
Cholera Infantum	—	—	—	1	1	—	1	—	—	—	2	—	—	—	—	—	—	—	—	—	4	1	1	—	—	1	—	—	—	—			
Diarrhoea and Dysentery	—	—	—	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—			
Congestion of the Lungs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	5	—	—	—	—	—	—	—	—			
Acute Bronchitis	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	22	—	—	—	—	—	—	—	—			
Acute Pneumonia	—	—	1	—	7	—	—	—	—	—	9	—	—	—	—	—	—	—	—	2	1	41	2	—	—	—	—	—	—	—			
Consumption	—	—	—	26	2	1	—	—	—	—	17	—	—	—	—	—	—	—	—	2	75	3	—	—	—	—	—	—	—	—			
Total Deaths	2	1	3	90	2	4	2	7	0	10	73	3	7	5	2	5	2	43	10	16	490	29	8	—	—	1	2	0	9	4			
Estimated Population	500	2,000	2,500	2,000	65,000	200	2,069	1,000	3,000	7,000	1,200	10,000	1,000	60,000	2,500	8,000	5,000	2,000	3,500	1,800	30,000	8,000	18,000	330,000	25,000	4,000	1,240	500	3,800	15,000	5,849	2,000	5,216
	Lockeford	Long Beach and vicinity	Livermore	Lodi and vicinity	Los Angeles	Mentone	Merced	Mariposa	Monterey	Napa and vicinity	National City	North Temescal and vicinity	Needles and vicinity	Oakland	Ontario and vicinity	Petaluma and vicinity	Pomona and vicinity	Pleasanton and vicinity	Redlands and vicinity	Rio Vista and vicinity	Sacramento	San Bernardino	San Diego	San Francisco	San José	San Luis Obispo	San Pedro	San Pablo	San Rafael	Santa Ana and vicinity	Santa Barbara	Solano County, District No. 2	Santa Rosa

[illegible]

JUNE, 1894.

Reports from 60 cities, towns, villages, and sanitary districts, aggregating a population of 759,881, show a mortality of 827, or a death-rate of 1.08 per 1,000 for June, or 12.96 per 1,000 per annum.

There were 148 deaths from consumption, 53 from pneumonia, 26 from acute bronchitis, 5 from congestion of the lungs, 10 from diarrhœa and dysentery, 16 from cholera infantum, 49 from other diseases of the stomach and bowels, 9 from diphtheria, 1 from croup, 2 from scarlatina, 1 from measles, 9 from whooping-cough, 15 from typhoid fever, 3 from malarial fevers, 14 from cerebro-spinal fever, 32 from cancer, 1 from erysipelas, 96 from diseases of the heart, 7 from alcoholism, 3 from la grippe, and 427 from all other causes.

There were no deaths from smallpox, though it is reported as lingering in Goose Lake Valley.

PREVAILING DISEASES.

Reports of prevailing diseases in 32 localities outside the cities and towns, give 28 cases of pneumonia, 64 of bronchitis, 10 of pleuritis, 10 of congestion of the lungs, 154 of diarrhœa, 51 of dysentery, 26 of cholera morbus, 23 of cholera infantum, 2 of diphtheria, 1 of croup, 7 of scarlatina, 27 of measles, 86 of whooping-cough, 29 of la grippe, 25 of typhoid fever, 185 of malarial fevers, 11 of cerebro-spinal fever, 13 of erysipelas, 64 of rheumatism, 41 of neuralgia, 51 of tonsillitis, and 23 of pharyngitis.

Measles was reported epidemic at Long Branch, Pomona, and Anaheim; and whooping-cough at Upper Lake.

Interruption of the mails, by reason of the general strike of employés of the California railroads, has prevented a full report for June, but it is believed that the average of mortality is about as given above, which is very low, and would indicate a highly favorable condition of health throughout the State.

Abstract of the Reports of Deaths and their Causes in the following Cities and Towns of California during June, 1894.

[illegible]

	Estimated Popu- lation	Total Deaths	Consumption.....	Acute Pneumonia.	Acute Bronchitis..	Congestion of the Lungs.....	Diarrhoea and Dys- entery.....	Cholera Infantum.	Other Diseases of St'mach & Bow'ls	Diphtheria	Croup.....	Scarlet Fever	Measles.....	Smallpox	Whooping-Cough..	Typho - Malarial Fever	Typhoid Fever	Remittent and In- termittent Fevers	Cerebro - Spinal Fever.....	Cancer	Erysipelas.....	Heart Diseases	Alcoholism.....	Other Causes
Oakland	60,000	56	6	4	—	—	—	1	—	—	—	—	—	—	4	—	1	—	—	6	—	—	—	26
Oroville	2,000	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Ontario and vicinity	2,500	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
Pasadena and vicinity	9,500	8	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Petaluma and vicinity	12,000	4	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Pomona and vicinity	5,000	9	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Redlands and vicinity	3,600	4	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Rio Vista and vicinity	1,800	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Sacramento.....	30,000	3	7	4	—	2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
San Bernardino.....	8,000	10	3	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19
San Diego.....	18,000	11	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
San Francisco.....	330,000	44	66	29	18	—	4	7	30	3	1	1	—	—	1	—	6	—	7	16	1	—	—	5
San José	18,027	46	8	1	2	—	—	2	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	200
San Luis Obispo	4,000	8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21
San Rafael	3,800	2	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6
Santa Maria.....	1,000	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Santa Ana and vicinity	10,000	10	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4
Santa Barbara	5,849	10	—	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5
Santa Rosa	5,216	6	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
Sausalito	1,200	2	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Stockton	17,000	14	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8
St. Helena and vicinity	2,500	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Truckee and vicinity	1,300	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tulare City.....	4,000	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Upper Lake.....	300	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vallejo.....	6,000	5	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
Watsonville and vicinity	3,000	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
Woodland	3,500	4	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
Totals.....	759,881	827	148	53	26	5	10	16	49	9	1	2	1	0	9	—	15	3	14	32	1	96	7	430

SECRETARY'S REPORT.

To the State Board of Health:

GENTLEMEN: The foregoing reprint of the monthly circulars issued by the Board during the period for which this report is made, is not published as an exact statement of mortality records. The circular is made up from municipal and voluntary reports of physicians throughout the State. A more accurate statement is herewith subjoined in a table made up from reports of County Recorders, according to law. To these have been added the very accurate and complete reports of the San Francisco Board of Health. Some counties have ignored the law of registration altogether; others state that the fault lies with medical men who do not make reports.

The law with reference to the registration of births and marriages is almost entirely ignored. The enforcement of the law appears to rest with the District Attorneys and the Boards of Supervisors. A simple expedient would settle the question for all time. Let Boards of Supervisors appoint an attorney in each county to look up and prosecute delinquent persons, whether physicians and midwives who neglect to register births and deaths, or clergymen and justices who neglect to register marriages; and allow as a fee, one half of the \$50 imposed by law as penalty for neglect or refusal to make such registration.

Judging by the results already obtained, I may consistently promise that the next biennial report of vital statistics will reach practicable exactness. The collection of such statistics from a population estimated at about 1,250,000, settled over an area of territory three times the size of the New England States put together, is a matter of no little labor. Then, considering the distance that reports have to traverse by stage and rail, the slight difference between the percentage of deaths as shown in the hastily improvised monthly circular and by the deliberately collected figures shown in the tables, is in a measure accounted for.

MORTUARY STATISTICS.

[For the fiscal year from June 30, 1892, to June 30, 1893.]

The total number of deaths from all causes for the year was 13,166. Estimating the population of California to be 1,250,000, makes the death-rate 10.53 per thousand of the population.

Smallpox.—There were 8 deaths from smallpox before the epidemic located at two principal points was stamped out.

Measles.—There were 48 deaths from measles.

Scarlatina.—There were 178 deaths from scarlatina, showing an increase of 75 over 1889 and 1890, and an increase of 137 over the preceding year.

Diphtheria.—There were 192 deaths from diphtheria, and 86 from croup. Classing these two diseases as identical, makes a total of 278 due to diphtheria and croup. This is a marvelous reduction from the

death-rate of diphtheria for the two preceding years. During the fiscal year from June 30, 1890, to June 30, 1891, there were 538 deaths due to diphtheria and croup; and during the fiscal year from June 30, 1891, to June 30, 1892, there were 669 deaths due to diphtheria and croup. Inasmuch as a greater increase in fatalities from an infectious disease invariably suggests inquiries into the cause of such increase, so great a reduction in mortality from this frightful disease justifies an inquiry. It will be remembered that the threatened invasion of cholera from Europe was in the early part of 1892. The State Board of Health at that time took a decided stand in favor of personal and municipal cleanliness, urging against a dependence upon maritime and land quarantine alone; claiming that while there could be maintained a practical quarantine by sea, that an effectual land quarantine, which must necessarily be relative, could at no time be deemed sufficient; that the only thing that could with certainty successfully resist the invasion, if it once effected a landing, was the removal of all filth, both private and municipal; in other words, the doctrine of personal and public purity was advocated, and to follow out these views to their practical application we have a logical result in a reduction in the death-rate from all filth diseases. The most notable reduction in the death-rate from diphtheria is in San Francisco and the larger cities of the State. It would seem, therefore, that the expense of a general cleaning-up during the last two years, while our people were being operated on by fears of an invasion from cholera, has not been thrown away. In addition to the security obtained from the foreign pestilence, we have saved many scores of lives in the lessened death-rates from diphtheria, scarlatina, and typhoid fever.

Influenza (La Grippe).—La grippe is credited with 50 deaths during the year, the fatalities being confined almost entirely to the winter months. The year preceding there were 223 deaths from the same cause, and 50 the year before that.

Whooping-Cough.—Whooping-cough caused 25 deaths during the year, as against 94 the year previous, at which time la grippe prevailed quite extensively.

Typhoid Fever.—There were 322 deaths due to typhoid fever.

Cerebro-Spinal Fever.—Cerebro-spinal fever caused 71 deaths during the present year.

Respiratory Diseases.—There were 2,032 deaths from consumption, 979 from pneumonia, 38 from pleurisy, 356 from bronchitis, and 246 from other diseases of the respiratory organs. This would show a total of 3,651 deaths from chronic and acute respiratory diseases during the year.

Alcoholism.—Alcoholism, directly or remotely, is credited with 78 deaths, and this would include also delirium tremens.

[For the fiscal year, from June 30, 1893, to June 30, 1894.]

The total number of deaths from all causes during the year was 11,349, making a death-rate of 9.71 per thousand in an estimated population of 1,250,000.

Smallpox.—There was but 1 death from smallpox during the year; this occurred in Modoc County, in a remote locality in the northeastern portion of the State; at the time of publication it is reported as having been entirely stamped out.

Measles.—There were but 4 deaths reported as being due to measles during the year.

Scarlatina.—Scarlatina is credited with but 23 deaths. It would seem that this disease has also followed the downward pace in the scale of lessened mortality since the general clean-up in anticipation of cholera.

Diphtheria.—There were 155 deaths from diphtheria during the year, which, added to 62 from croup, would make 217. This would show a reduction of 61 from the previous year, and would go far toward showing it to be possible to still further reduce the fatalities from this scourge to a point which would excite little or no fear.

Influenza (La Grippe).—During the year there were 103 deaths attributed to la grippe, the winter, as usual, showing the greatest number of fatalities. There has been little or no deviation from the ordinary course of the disease as observed during the epidemic, which has now lasted for five or six years. Many who had the disease the first winter have since been attacked more than once.

Whooping-Cough.—Whooping-cough is credited with 60 deaths.

Typhoid Fever.—There were 295 deaths, against 322 for the previous year.

Cerebro-Spinal Fever.—There were 57 deaths from cerebro-spinal fever, as against 71 during the previous year.

Respiratory Diseases.—There were 1,789 deaths from consumption, 889 from pneumonia, 31 from pleurisy, 342 from bronchitis, and 221 from other diseases of the respiratory organs. This would show 3,272 deaths from chronic and acute respiratory diseases during the year.

Alcoholism.—Alcoholism, directly or remotely, including delirium tremens, is credited with 65 deaths.

REPORT OF DEATHS FROM JULY, 1892, TO JULY, 1893.

Causes of Deaths.	Sexes.		Ages.									Nativities.						
	Total.	Male	Female	Unascertained	Under 1 year	1 and under 5 years	5 and under 10 years	10 and under 20 years	20 and under 30 years	30 and under 40 years	40 and under 50 years	50 and under 60 years	60 and under 100 years	Unascertained	Pacific States	Atlantic States	Foreign Countries	Unascertained
I.—ZYMOTIC OR EPIDEMIC.																		
Cholera infantum	241	134	99	8	183	44	2	2	1	9	14	15	11	234	2	2	5	5
Diarrhea and dysentery	192	127	53	12	80	27	8	2	8	1	1	15	24	115	21	21	48	8
Smallpox	48	3	5	3	3	1	2	3	1	1	1	1	1	6	1	1	3	1
Measles	178	81	25	4	23	14	19	3	1	5	3	4	8	41	3	3	3	1
Scarlatina	192	118	73	1	79	74	58	24	2	5	3	4	8	153	13	13	12	1
Diphtheria	192	118	73	1	79	74	58	24	2	5	3	4	8	153	13	13	12	1
Group	86	54	32	11	42	26	1	1	1	1	1	1	6	77	6	6	5	1
Infuenza	50	23	27	10	22	16	1	1	1	1	1	1	7	39	6	6	5	1
Whooping-cough	25	14	10	1	12	3	2	2	2	2	1	1	5	17	2	2	5	1
Erysipelas	21	13	8	3	3	3	2	2	2	2	1	1	6	6	1	1	11	3
Fever—Typhoid	322	201	111	10	11	12	28	60	82	50	32	13	25	109	79	79	130	4
Remittent and Intermittent	53	27	25	1	1	7	2	1	8	1	4	4	10	5	27	11	14	1
Cerebro-spinal	71	41	29	1	29	25	7	3	6	4	3	3	3	56	7	7	8	1
Alcoholism (direct or remote), including delirium tremens	78	68	8	2	1	1	1	1	3	8	15	25	25	1	8	24	43	3
II.—CONSTITUTIONAL DISEASES.																		
Tubercular meningitis	58	30	28	20	19	8	4	4	3	3	1	1	1	44	9	9	5	1
Phthisis pulmonalis	2,032	1,090	403	29	18	22	155	524	524	532	352	218	156	486	598	598	916	32
Rheumatism	51	30	21	3	1	1	1	8	11	7	6	13	13	13	15	15	23	2
Cancer	413	219	190	1	1	1	3	9	9	37	73	121	164	4	28	150	233	2
III.—LOCAL DISEASES.																		
Pneumonia	979	620	357	2	168	112	28	44	88	95	111	110	213	378	219	219	367	15
Pleurisy	38	27	11	1	1	1	1	5	2	2	7	6	17	1	1	16	19	2
Bronchitis	336	210	146	110	46	12	3	9	16	44	23	91	2	162	58	58	134	2
Other diseases of respiratory organs	246	158	86	2	3	17	4	24	23	32	40	67	1	84	57	57	104	1
Diseases of the liver	204	134	70	12	7	3	1	7	29	41	55	54	2	33	52	52	117	2
Other diseases of stomach and bowels	1,409	847	549	13	370	77	41	69	145	166	142	142	232	25	633	323	436	17
Bright's disease and nephritis	379	268	108	3	13	11	13	31	50	59	78	122	2	69	122	122	184	4
Diseases of the heart	1,051	652	381	15	21	7	15	42	61	97	147	224	404	33	159	331	543	18

REPORT OF DEATHS FROM JULY, 1893, TO JULY, 1894.

Causes of Deaths.	Sexes.		Ages.												Nativities.			
	Total.	Male	Female	Unascertained	Under 1 year.	1 and under 5 years.	5 and under 10 years.	10 and under 20 years.	20 and under 30 years.	30 and under 40 years.	40 and under 50 years.	50 and under 60 years.	60 and under 100 years.	Unascertained	Pacific States	Atlantic States	Foreign Countries	Unascertained
I.—ZYMOTIC OR EPIDEMIC.																		
Cholera morbus	14	11	3		4	12	4	3				2	5	1	7	3	4	
Cholera infantum	130	64	66	2	113	12	1		1	9	8	7	19		41	15	29	
Diarrhoea and dysentery	88	52	36	3	30	13	1		1			1			2	2	1	
Smallpox	1	1				3	1	2							15	4	1	
Measles	4		4				1		1						129	23	3	
Scarlatina	23	16	7		2	16	2	30	3	1			1		60	1		
Diphtheria	155	79	75	1	13	59	48								23	47	32	
Croup	62	35	27		18	34	10	1	1	5	15	14	55		53	1		
Influenza	103	52	50	1	8	2	1	1	2	5	5	3	8		16	6	14	
Whooping-cough	60	28	32		32	26	2		1						94	76	121	
Erysipelas	37	25	12		9	2	2	48	90	52	25	23	20	1	22	10	17	
Fever—Typhoid	295	186	106	3	6	10	20	4	6	6	6	3	11	1	43	9	4	
Remittent and intermittent	52	35	17		4	9	2	2	4	3								
Cerebro-spinal	57	32	25		16	18												
Alcoholism (direct or remote), including delirium tremens.	65	56	9						4	13	16	12	20		5	22	38	
II.—EXTERNAL CAUSES.																		
Convulsions	221	141	78	2	139	50	9	5	8	4		3			197	7	14	
Other diseases of brain and nervous system	974	612	339	3	104	85	39	19	42	71	105	158	345	6	284	362	378	
IV.—DEVELOPMENTAL DISEASES.																		
Old age	319	160	152	7									317	2	28	115	171	
V.—EXTERNAL CAUSES.																		
Suicide	219	176	41	2	1			3	35	55	47	45	31	3	30	48	128	
Heat, death from—sunstroke	1														1			
All other causes not classified	2,062	1,218	829	15	399	66	41	76	162	271	211	251	423	129	688	355	551	
Stillbirths	589														589			
Totals.	13,166	7,924	4,403	650	1,800	864	439	557	1,276	1,550	1,481	1,552	2,789	275	4,001	2,972	4,617	636

REPORT OF DEATHS FROM JULY, 1893, TO JULY, 1894.

REPORT OF DEATHS FROM JULY, 1893, TO JULY, 1894—Continued.

Causes of Deaths.	Sexes.			Ages.								Nativities.						
	Total.	Male	Female	Unascertained	Under 1 year	1 and under 5 years	5 and under 10 years	10 and under 20 years	20 and under 30 years	30 and under 40 years	40 and under 50 years	50 and under 60 years	60 and under 100 years	Unascertained	Pacific States	Atlantic States	Foreign Countries	Unascertained
II.—CONSTITUTIONAL DISEASES.																		
Tubercular meningitis	75	37	38	1	18	29	14	3	6	3	1	166	150	1	61	6	6	2
Phthisis pulmonalis	1,789	1,150	638	1	17	31	9	122	553	479	258	5	24	4	429	549	790	21
Rheumatism	52	36	15	1	1	1	1	4	4	6	7	5	5	6	6	22	24	4
Cancer	326	156	170		1	1		1	6	35	73	97	113		15	114	193	4
III.—LOCAL DISEASES.																		
Pneumonia	889	524	364	1	130	99	20	21	73	94	109	128	209	6	325	225	325	14
Pleurisy	31	23	8					1	3	5	1	6	15		4	10	17	3
Bronchitis	342	191	148	3	103	43	5	4	4	10	36	934	100	3	139	45	135	2
Other diseases of respiratory organs	221	140	81		30	9	4	5	21	22	34	38	57	1	56	57	106	7
Diseases of the liver	158	111	47		1	1		1	5	24	34	43	48		15	46	95	7
Other diseases of stomach and bowels	738	412	323	3	55	24	29	58	76	68	42	123	8	8	399	134	194	11
Bright's disease and nephritis	416	268	147	1	2	3	7	15	44	50	74	72	147	2	65	142	292	7
Diseases of the heart	842	553	287	2	14	5	11	35	66	71	123	129	291	4	122	273	433	14
Convulsions	166	88	78		118	30	4	2	3	5	3	1			149	11	6	17
Other diseases of brain and nervous system	996	637	356	3	123	88	23	23	33	99	92	146	363	6	588	309	382	17
IV.—DEVELOPMENTAL DISEASES.																		
Old age	307	171	135	1									307		9	117	180	1
V.—EXTERNAL CAUSES.																		
Suicide	230	196	34					6	37	63	50	34	39	1	30	56	137	7
Heat, death from—sunstroke	2	2	1							1				1		1		
All other causes not classified	2,083	1,358	716	9	457	86	49	87	222	249	292	218	403	20	773	582	676	52
Stillbirths	540														340			
Totals	11,319	6,725	4,049	35	1,523	684	269	450	1,252	1,389	1,330	1,229	2,622	61	4,097	2,918	4,166	168

REPORTS AND CORRESPONDENCE.

The first report will be the statement of the expenses of the State Board of Health for the forty-fourth and forty-fifth fiscal years, ending June 30, 1894.

The next following is a report by the inspector against smallpox in the northern part of the State. In the early part of the summer of 1892 smallpox prevailed quite extensively among the population around Puget Sound. It became necessary to place an inspector at the northern boundary of the State to guard against its crossing the line from that direction. During the course of the summer of the same year the country was threatened with an invasion of cholera from Europe, and acting under instructions of the State Board of Health, I appointed inspectors to act at Truckee, The Needles, and Yuma, in order to be thoroughly prepared in case it should approach from any of those directions. Before doing so I drafted instructions, based upon the statutes giving the Board authority in such matters; these instructions were submitted to George A. Knight, attorney for the State Board of Health, and by him approved as sufficient; they were also submitted to the General Manager of the Southern Pacific Company, A. N. Towne, who was also satisfied with them. This was done because the railroad companies are so closely interested in epidemics that are likely to be conveyed by their trains. It was therefore deemed advisable to confer with them, so that there might be a coöperation between them and the sanitary officers.

The correspondence between myself and George A. Knight and A. N. Towne is given, also a report made by me to the National Conference of State Boards of Health with reference to the condition of quarantine in California.

It was deemed necessary by the State Board of Health to publish a circular on the restriction and prevention of cholera. A committee was appointed to prepare such a circular, but the circular published by the Connecticut State Board of Health was found to be so well suited for our purpose that, with the consent of the honorable Secretary, Dr. C. A. Lindsley, it was adopted as a whole. The consent of Dr. Lindsley is published with the circular.

There was some controversy between the State Board quarantine officials and the Governor of Arizona Territory with reference to the establishment of a quarantine station at or near Yuma. The Board decided it advisable, in view of the conditions on the desert west of Yuma, to establish the quarantine, if possible, on the Arizona side of the river. The attorney for the State Board of Health advised us that we could do so legally, provided we obtained the consent of the Arizona authorities. To this, however, Governor N. O. Murphy, of Arizona, objected, and it became necessary to stop the trains on the arid desert this side of the river. Some of the correspondence, in the shape of telegrams from General Manager A. N. Towne, is published to show, in a measure, the situation at that time. This is done more with a view to the benefits that may arise in the future than from a mere desire to show what happened at that time. Two committees were appointed to visit the locality. Nevertheless, but little was accomplished. I took occasion the following winter to visit Yuma, in order to satisfy myself by personal observation as to what would be necessary in case of the approach of an

epidemic from that direction. I concluded that while detention of passengers on the barren desert would necessarily be cruel, yet it was on a line the least liable to be traversed by cholera. Unless cholera were to prevail quite extensively throughout the Middle and Southern States, it is quite unlikely to reach California by that route, therefore there will probably be less reason for detention on the desert than elsewhere.

I have caused to be printed in this report a reply to a special committee of the New York Board of Trade and Transportation, relating to quarantine matters in our own country. It is with a feeling of some self-congratulation that I am able to state that Congress enacted into law every recommendation made in that reply.

I have caused to be printed my instructions to Dr. L. A. Elster, whom I appointed special inspector for smallpox at San Luis Obispo and vicinity; also his report relating to his action in the matter.

I have also added a report of tests with tuberculin at the Stockton Insane Asylum, with the clinical histories of the cases and the proving of the tests.

Also a report by special committee of the recent inspection of the Home for the Feeble-Minded at Glen Ellen.

There is also added a report to the Governor by Dr. Ruggles, who was appointed to represent the State of California at the Pan-American Medical Convention that assembled at Washington, D. C., on September 5, 1893.

I have also caused to be published a paper on "Tests for Impurities in Drinking Water," by Dr. Winslow Anderson; and a "Study of Water in Relation to Health and Diseases," by Dr. George M. Kober.

This brief statement is, in my estimation, all that is necessary for me to make with reference to what is herein contained, as a perusal of the reports will more particularly reflect the work that has been done during the past two years. Suffice it to add, that while congratulating ourselves and the people of the State of California that we have escaped an invasion of cholera for two and nearly three succeeding summers, we have also in making ready for the unwelcome guest so purified the plague spots in our cities, towns, and villages, that there has been perceptible a great decrease in the number of deaths from zymotic diseases. The general purification has placed us in a condition to make us contemplate with little or no apprehension the plague now raging in China.

Very respectfully,

J. R. LAINE,
Secretary State Board of Health.

FINANCIAL STATEMENT.

STATEMENT OF THE EXPENSES OF THE STATE BOARD OF HEALTH FOR THE FORTY-FOURTH FISCAL YEAR, ENDING JUNE 30, 1893.

Appropriation April 6, 1891.....		\$1,500 00
Balance from forty-third fiscal year.....		8 83
1892.		
Aug.—Rent	\$25 00	
Telegrams	1 45	
Traveling expenses, C. A. Ruggles	14 40	
Sept.—Traveling expenses, W. G. Cochran	81 00	
Traveling expenses, J. R. Laine	15 85	
Traveling expenses, C. A. Ruggles	24 90	
Rent	25 00	
Stamps	32 00	
Telegrams and expressage	5 10	
Traveling expenses, C. W. Nutting	14 00	
Oct.—Rent	25 00	
Telegrams	13 76	
Stamps	20 00	
Expressage	2 45	
Traveling expenses, W. G. Cochran	58 50	
Nov.—Traveling expenses, C. A. Ruggles	28 40	
Rent	25 00	
Stamps	20 00	
Telegrams	1 25	
Expressage	85	
Traveling expenses, W. G. Cochran	50 50	
Traveling expenses, C. A. Ruggles	14 40	
Dec.—Rent	25 00	
Stamps	45 00	
Express wagon	1 00	
1893.		
Jan.—Rent	25 00	
Expressage	70	
Stamps	15 00	
Feb.—Rent	25 00	
Subscription "Sanitarian," 1894	4 00	
Telegrams	1 70	
Stamps	15 00	
March—Expenses, W. G. Cochran	56 75	
Traveling expenses, J. R. Laine	26 25	
Traveling expenses, C. A. Ruggles	34 00	
Rent	25 00	
Stamps	120 00	
Telegrams	1 85	
Express wagon	1 00	
Stationery	3 95	
Expressage	35	
April—Rent	25 00	
Telegrams	28 88	
Express wagon	4 25	
Stamps	20 00	
Expenses, C. A. Ruggles	8 90	
May—Traveling expenses, J. R. Laine	48 70	
Rent	25 00	
Stamps	5 00	
Express	75	
Telegrams	85	
Stationery	75	
Traveling expenses, Winslow Anderson	53 20	
Traveling expenses, C. W. Nutting	124 85	
Traveling expenses, W. F. Wiard	48 70	
Traveling expenses, J. H. Davisson	90 95	
Traveling expenses, C. A. Ruggles	62 40	
Traveling expenses, P. C. Remondino	35 29	
Totals	\$1,508 83	\$1,508 83

EXPENDITURES STATE BOARD OF HEALTH, FORTY-FOURTH FISCAL YEAR—APPROPRIATIONS, DEFICIENCIES THAT MAY OCCUR IN STATE DEPARTMENTS.

1893.
June—Balance traveling expenses, P. C. Remondino..... \$42 21

STATEMENT OF THE EXPENSES OF THE STATE BOARD OF HEALTH FOR THE FORTY-FIFTH FISCAL YEAR, ENDING JUNE 30, 1894.

Appropriation March 25, 1893.	\$1,500 00	
1893.		
August—Rent	\$25 00	
Stamps	6 20	
Sept.—Rent	25 00	
Stamps	10 00	
Telegrams	4 74	
October—Rent	25 00	
Stamps	10 00	
Express	5 80	
Telegrams	1 00	
Traveling expenses, W. F. Wiard	27 90	
Traveling expenses, Winslow Anderson	49 54	
Traveling expenses, C. A. Ruggles	44 15	
Nov.—Traveling expenses, Winslow Anderson	17 60	
Rent	25 00	
Stamps	10 00	
Dec.—Rent	25 00	
Postal cards and stamps	15 00	
1894.		
Jan.—Rent	25 00	
Stamps	10 00	
Express	2 40	
Traveling expenses, C. A. Ruggles	12 40	
Feb.—Traveling expenses, C. A. Ruggles	77 65	
Rent	25 00	
Expressage	1 05	
Telegrams	65	
Stamps	10 00	
Rubber bands	1 50	
"Sanitarian," 1894	4 00	
March—Traveling expenses, J. R. Laine	8 35	
Rent	25 00	
Stamps	15 00	
Expressage	30	
Postage and traveling expenses, C. A. Ruggles	10 65	
April—Rent	25 00	
Stamps and postal cards	17 50	
Expressage	8 10	
Telegrams	50	
Ink	1 00	
"Sanitarian," January to December, 1894	4 00	
D. Van Nostrand Co., sewerage	6 00	
May—Traveling expenses, etc., J. R. Laine	69 40	
Traveling expenses, J. H. Davisson	26 60	
Traveling expenses, W. F. Wiard	29 10	
Traveling expenses, C. A. Ruggles	41 50	
June—Rent	25 00	
Stamps	10 00	
Repairing typewriter	1 25	
Express	25	
Telegraph Mill, case for registers	19 00	
D. Van Nostrand Co., sewerage	6 00	
Traveling expenses, C. W. Nutting	38 10	
Traveling expenses, etc., J. R. Laine	41 35	
Traveling expenses, C. A. Ruggles	39 00	
Traveling expenses, J. H. Davisson	77 90	
Traveling expenses, W. F. Wiard	35 40	
Traveling expenses, C. A. Ruggles	17 80	
Total	\$1,095 63	
June 30—By balance	404 37	
Totals	\$1,500 00	\$1,500 00

EXPENSES OF THE STATE BOARD OF HEALTH ON ACCOUNT OF CONTAGIOUS AND INFECTIOUS DISEASES FOR FORTY-FOURTH AND FORTY-FIFTH FISCAL YEARS.

1892.			
July 1—	Unexpended balance in appropriation.....		\$5,732 45
	Appropriation March 23, 1893.....		50,000 00
	A. H. Smith, vaccine.....	\$20 00	
Sept.—	Services and traveling expenses, C. A. Ruggles.....	444 55	
Oct.—	Assessment National Board of Conference.....	10 00	
	Neville & Co., tents.....	532 40	
Nov.—	Salary, clerk to Secretary, R. M. Ingle.....	60 00	
	Expenses, W. G. Cochran and H. Nadeau.....	21 50	
	Traveling expenses, C. A. Ruggles.....	250 24	
	Expenses, P. G. Cotter.....	374 28	
	Assistant Executive Committee National Conference.....	30 00	
	S. P. R. R. Co., special train, Yuma to Ogilby.....	154 76	
1893.			
Jan.—	Expenses, Jas. P. Booth.....	90 35	
	Expenses, W. G. Cochran.....	54 50	
Feb.—	A. H. Smith & Co., vaccine.....	10 00	
March—	Traveling expenses, C. A. Ruggles.....	253 40	
	Services and traveling expenses, L. A. Elster.....	324 00	
Apr.—	Traveling expenses, J. R. Laine.....	78 25	
	Services and traveling expenses, L. A. Elster.....	299 30	
	Services and traveling expenses, C. A. Ruggles.....	120 25	
May—	Expenses, P. C. Remondino.....	47 25	
	Traveling expenses, C. A. Ruggles.....	21 40	
	Reporting and transcribing, G. W. Smith.....	38 00	
	Rent of hall, gas, etc., Sanitary Convention, S. F.....	31 75	
June—	Salary and traveling expenses, L. A. Elster.....	292 60	
	Services and traveling expenses, L. A. Elster.....	162 00	
Total expenditures forty-fourth fiscal year.....			\$3,720 86
<hr/>			
1893.			
July—	Traveling expenses, M. F. Price.....	\$15 00	
	Traveling expenses, J. H. Davisson.....	34 20	
	Traveling expenses, etc., C. A. Ruggles.....	146 54	
	Printing pamphlets, Sanitary Convention.....	242 70	
	Printing programmes, Sanitary Convention.....	5 00	
	Services, L. A. Elster, assistant to Secretary.....	247 93	
Sept.—	Services, L. A. Elster, assistant to Secretary.....	467 35	
	Examining property at Yuma, etc.....	5 95	
Oct.—	Services and traveling expenses, L. A. Elster.....	77 50	
Nov.—	Annual assistant State Board of Health.....	30 00	
	A. H. Smith & Co., vaccine.....	2 00	
	Traveling expenses, C. A. Ruggles.....	278 15	
	Traveling expenses, J. H. Davisson.....	201 25	
Dec.—	W. B. Rising, analysis of confectionery.....	10 00	
1894.			
Jan.—	Traveling expenses, C. W. Nutting.....	239 10	
	Minnie Heapley, typewriting.....	20 00	
	H. B. Baker, assistant, National Convention.....	10 00	
Feb.—	Express.....	2 35	
	Telegrams.....	1 00	
	Traveling expenses, J. H. Davisson.....	41 00	
March—	Traveling expenses, C. A. Ruggles.....	31 40	
May—	Louis Liebes, printing signs.....	4 00	
	Traveling expenses, W. F. Wiard.....	20 00	
	Traveling expenses, J. H. Davisson.....	60 00	
	Traveling expenses, J. R. Laine.....	20 00	
	Traveling expenses, C. A. Ruggles.....	22 50	
	Advertising, Sanitary Convention.....	23 75	
	Traveling expenses, W. Anderson.....	26 90	
	Traveling expenses, Geo. W. Smith.....	60 00	
June—	Traveling expenses, C. W. Nutting.....	35 50	
Total.....		\$6,101 93	
June 30—	By balance.....	49,630 52	
Totals.....		\$55,732 45	\$55,732 45

REPORTS AND CORRESPONDENCE.

MEDICAL INSPECTOR'S REPORT—SMALLPOX IN BRITISH COLUMBIA.

During the months of June and July, 1892, various sensational and unverified reports had reached the State Board of Health relating to the prevalence of smallpox in British Columbia, at Victoria and Vancouver, threatening the State of California with invasion over the lines of railroad through Washington and Oregon.

These rumors and reports finally coming with so much authenticity, it was deemed advisable to place a Medical Inspector on the California and Oregon Railroad, to serve in compliance with "An Act to prevent the introduction of contagious diseases into the State of California," approved March, 1883. At a meeting of the Board, held at Sacramento July 26, 1892, I was honored with an appointment as Medical Inspector, and was instructed to take a position on the line of railroad, near the northern boundary of the State, and to rigidly and carefully inspect all immigrants and other passengers coming into the State. I was amply supplied with letters of introduction, and instructions to all employés of railroads by A. N. Towne, Esq., General Manager, securing by that method their hearty coöperation in my sanitary mission. I met the Division Superintendent at Dunsmuir in consultation, who advised me to locate my headquarters at Ashland, Oregon, as the time-table made it much more convenient for me to meet the incoming trains from the north at that point than at any other.

I selected a position for a quarantine hospital at a point near the dividing line between Oregon and California. The place was admirably adapted to that purpose, by having a good water supply, a side-track, and shelter from heat by high elevations on each side. There was such an amount of uncertainty as to how much smallpox there really was, that I deemed it advisable to become familiar with the situation all along the line from California to Victoria, and make all necessary arrangements with health departments, so that I might speedily become acquainted with the daily condition of matters, by establishing telegraphic communication with Portland, Oregon, and Tacoma and Seattle, Washington, to whose Health Officers I am under many obligations for acts of kind courtesies extended to me.

To become acquainted with the exact condition, I concluded to visit Victoria, B. C., where it was stated to me, by the United States authorities at Port Townsend, there existed a very uncertain amount of smallpox. Upon meeting in conference the medical officer of Victoria and the United States Consul and other prominent citizens familiar with the subject, I ascertained that on the day of my visit there were fifty-eight cases of smallpox and many suspects; that only two days previous three new cases had developed, which latter fact, in my judgment, justified a continuance of excluding quarantine established by Port Townsend, Tacoma, and Seattle against British Columbia, and on my return I so reported to them.

It was satisfactorily arranged with the Health Officers at the aforementioned places that the earliest possible knowledge of any suspicious passengers on trains should be telegraphed to me at Ashland, Oregon; and at 10:30 A. M. each day, as the train came from the north, I took passage, and when the State line was passed I made a careful personal examination of every passenger on that train, particularly if they came from either of the above stated places. My examination was completed in time to take the northern-bound train at Hornbrook, California, arriving at Ashland at 4:30 P. M. Fortunately I did not find a case of variola during the six weeks of daily inspection.

Being well supplied with Martin's bovine virus, I vaccinated all railroad employes, and all others who wished it, free of charge.

From information received from Health Officers at Tacoma, Seattle, and Port Townsend, and from United States Consul Myers, at Victoria, B. C., I was satisfied that the disease at that point was under control, and reported to Dr. Laine, Secretary of the State Board of Health, that I did not deem it necessary for me to remain on duty any longer, consequently I was relieved.

C. A. RUGGLES, M.D.,
Medical Inspector.

Mr. ———:

DEAR SIR: You are hereby appointed Medical Inspector for the California State Board of Health, to serve in compliance with an Act to prevent the introduction of contagious diseases into California, approved March 16, 1883, which Act is hereby made a part of your instructions, and reads as follows:

SECTION 1. Whenever there shall exist, in the opinion of the State Board of Health, imminent danger of the introduction of contagious or infectious diseases into the State of California, by means of railroad communication with other States, the said State Board of Health are authorized, and it is hereby made their duty, to make, or cause to be made, by an accredited officer or inspector, an inspection of all railroad cars coming into the State at such point, or between such points, within the State limits as may be selected for the purpose.

SEC. 2. Such inspection shall be made, where practicable, during the ordinary detention of a train at a station, or while in transit between stations, and in all cases shall be so conducted as to occasion the least possible detention or interruption of travel, or inconvenience to the railroad companies, so far as consistent with the purpose of this Act.

SEC. 3. Should the discovery be made of the existence among the passengers of any dangerous, contagious, or infectious disease, the said Board of Health, or their agent or inspector, under rules and conditions prescribed by them as being applicable to the nature of the disease, shall have power to cause the side-tracking or detention of any car or cars so infected, to isolate the sick, or to remove them to a suitable place for treatment, to establish a suitable refuge station, to cause the passengers and materials in such infected car to be subjected to disinfection and cleansing before proceeding farther into the State, and, in case of smallpox, to offer free vaccination to all persons exposed in any car or at any station.

You are hereby directed to take a position on the line of the railroad, and to inspect all immigrants and other passengers coming into the State.

You will place yourself in communication with the Sheriff of the county where you are stationed, and demand from him the necessary number of deputies to enforce the provisions of these instructions, and to detain passengers held at the quarantine or refuge station as long as the public safety demands.

You are to establish daily telegraph communication with the Health Officials of ———, so as to ascertain if there are suspicious cases of disease on the trains destined for the interior. Should you discover

cholera on any train, you will cause the car in which it is found to be side-tracked, and the passengers quarantined and kept in a place suitable for the sick, and convenient to the railroad companies.

You will cause the car in which cholera was discovered to be cleansed and moistened on the interior by sprinkling with a solution of bi-chloride of mercury, when all clothes and personal effects of passengers that have been exposed to the disease are to be opened, hung up, or spread on the seats, and thoroughly fumigated with sulphur.

The fumigation is to be performed in the following manner: Place a kettle of water on the car stove and get it to boiling, for it is necessary that there should be steam, or the fumigation will be of little benefit. Then place an iron pan containing from four to eight pounds of sulphur, moistened with alcohol, supported by two bricks or stones, over a few inches of water in a tub. Let the windows and doors be tightly closed, the sulphur ignited, and the fumigating process maintained twelve hours. Let the doors then be opened and the car ventilated, when it may be considered safe to enter.

All persons who have been in any way exposed to the infection must be compelled to bathe and have their clothes fumigated before being allowed to proceed.

All cases of suspicious diseases of a diarrhœic character are to be detained until the nature of their ailment shall have been fully determined by you. You will detain all persons sick with cholera in a hospital camp to be selected for the purpose, where you will supply them with necessary food, care, and medical attendance.

You will keep the Secretary of the State Board of Health daily advised concerning your needs and requirements in carrying out these instructions.

You will keep a record of all the cases of cholera discovered, cars quarantined and fumigated, and all proceedings under the duties assigned you, and report them to the Secretary of the State Board of Health, every day while you are on duty.

You are to conduct the necessary precautions to be taken in such a manner as to put passengers and the railroad companies to the least possible inconvenience. While you are expected to be energetic and vigilant, you will avoid all arbitrary exhibition of authority.

In the performance of your duties, much is left to your discretion and good judgment; but you are charged by the State Board of Health not to exceed the authority vested in the Board by the Act which appears on these instructions, and under which they are given.

It is believed that you will exercise your powers with prudence, dignity, and courtesy.

By order of the State Board of Health.

OFFICE CALIFORNIA STATE BOARD OF HEALTH, }
SACRAMENTO, September 10, 1892. }

GEO. A. KNIGHT, *Att'y for the State Board of Health, San Francisco, Cal.:*

DEAR SIR: Agreeable to instructions of the State Board of Health, I transmit herewith a draft of instructions for the inspectors we contemplate placing on the State borders to exclude the epidemic of cholera now threatening the State.

Before adopting them, I desire to ask your opinion concerning the following points:

(1) Do these instructions to inspectors exceed the powers of the Board under the laws of California?

(2) Is there anything in the laws of the State authorizing the Board to use force in holding the people taken off an infected train in quarantine at refuge stations and camps?

(3) Have the Board of Health authority to exclude or turn back infected cars and prevent them from entering the State of California?

(4) What means can the State Board of Health employ under the general police power of the State in addition to the Act under which these instructions are made?

(5) What means may be employed by the State to prevent the people quarantined from escaping and scattering the infection throughout the State?

(6) Upon whom will devolve the expense for subsistence when passengers are detained at a refuge or land quarantine station?

I will await your reply with considerable impatience, as it is the wish of the Board that every preliminary step should be taken at the earliest possible date; and as the efficiency of land quarantine must depend largely upon the specific instructions given our inspectors, it is necessary that they should be supported by the laws of the State in every particular; and it is essential that the sanitary authorities should do all that the law will permit them to do to prevent cholera from effecting a lodgment among us.

Very respectfully yours,

J. R. LAINE, M.D.,
Secretary State Board of Health.

LAW DEPARTMENT OF THE
STATE AND SAN FRANCISCO BOARDS OF HEALTH, }
SAN FRANCISCO, September 13, 1892. }

J. R. LAINE, M.D., *Secretary State Board of Health, Sacramento, Cal.:*

DEAR SIR: Replying to your inquiries contained in your letter of date September 10, 1892, I beg to say:

(1) That your instructions to inspectors, of which you inclosed me a copy, are not in excess of the powers of Boards of Health, the State Board acting with the local health authorities, where there are such local health authorities, in emergencies of this character.

(2) It is within the power, and is the duty, of the Health Department of the State, coöperating with the local authorities, to use all force reasonably necessary in holding people ordered into quarantine, to be kept and detained there until discharged.

(3) The health authorities have undoubted power, and it is their duty, to turn back infected cars, and prevent infected cars, persons, and property from entering the State of California.

(4) Under the general police power of the State, the health authorities are vested with, and may employ, any means reasonably necessary in their judgment to effect the preventing of infectious or contagious disease from entering or coming within the State, by excluding all

infected persons and property from this State, preventing such persons or property coming into the State, and if any such persons or property are found within the State, then by quarantining them so long as reasonably necessary to prevent them spreading disease, and by disinfecting or destroying, as in the judgment of the health authorities is necessary, any infected property—the object in view being to keep out of the State all such contagion, and remove any that may have obtained a foothold in the State.

(5) I think the health authorities should place themselves in communication with the Sheriffs of the various counties, at such points as it is apprehended contagion may enter the State, and, coöperating with such Sheriffs, prevent any persons or property entering the State having infection among them, or in the property, and quarantining and keeping in quarantine so long as necessary all persons coming into the State from places reasonably apprehended to be infected, and either destroying or fumigating to such extent as necessary all property coming from any such infected place. All force necessary to effect these objects may be employed.

(6) I know of no means whereby money can be had by the health authorities, from any present existing fund, for these purposes, except the special fund of each department of health, and as these special funds are usually so small as not to be requisite to meet enlarged expenses of the kind in question, I believe that recourse will necessarily have to be had to the next Legislature to meet the expenses which may be incurred in keeping out contagion, by a special bill appropriating such amount as shall be necessary to liquidate the same. I believe that the transportation companies may be properly called upon to pay the expenses of fumigating vehicles of transportation, and all property brought by them into the State which, in the judgment of the health authorities, should be fumigated, including the property of passengers and their clothing and personal effects. But I do not believe that anybody can be made to stand the expenses of maintaining the quarantine stations, and the necessities of life for persons quarantined, but that relief must be had from the Legislature to meet any expenses which may be incurred, by way of a deficiency or relief bill.

Very respectfully,

GEO. A. KNIGHT,
Attorney for State Board of Health.

OFFICE CALIFORNIA STATE BOARD OF HEALTH, }
SACRAMENTO, September 10, 1892. }

A. N. TOWNE, *San Francisco, Cal.:*

DEAR SIR: Agreeable to instructions of the State Board of Health, I transmit herewith a draft of instructions to inspectors, which the Board contemplates placing at the State borders in case of danger of infection of the State by the epidemic cholera now raging in Europe.

These instructions will be modified to meet the reply of the attorney of the Board, Geo. A. Knight, to the interrogatories therein contained, a copy of which is also inclosed.

I would be glad if you would give me the benefit of your experience

in such matters, with such suggestions relating to modifications of these instructions as would conduce to the comfort of the passengers on the trains, and to the convenience of the railroad authorities.

Before the final adoption of a circular of instructions to inspectors, I would like to meet you to consult verbally with reference to these matters in a more extended manner than can be done by letter.

Yours very respectfully,

J. R. LAINE, M.D.,
Secretary State Board of Health.

SOUTHERN PACIFIC COMPANY, OFFICE OF THE
SECOND VICE-PRESIDENT AND GENERAL MANAGER, }
SAN FRANCISCO, CAL., September 12, 1892.

J. R. LAINE, *Esq., M.D., Secretary State Board of Health, 913 K Street, Sacramento:*

DEAR SIR: I am just in receipt of yours of the 10th instant, with inclosures, all of which I have read with care. It would seem to me that your general circular of instructions and your inquiry of Attorney Knight, pretty completely covers the ground.

As soon as you shall have received a reply from the latter gentleman, I would be very thankful for a copy of the same, and when it may be your convenience to call, it will afford me pleasure to see you and discuss the subject-matter of so much importance to our west coast, when possibly I may be able to make some suggestions that may be useful to you, when you are prepared to quarantine our three different ports of entry to the State by rail.

If there is anything we can do to aid you in the work you have outlined, please consider that we are at your service.

Yours truly,

A. N. TOWNE.

SOUTHERN PACIFIC COMPANY, OFFICE OF THE
SECOND VICE-PRESIDENT AND GENERAL MANAGER, }
SAN FRANCISCO, CAL., September 20, 1892.

Dr. J. R. LAINE, Secretary State Board of Health, Sacramento:

MY DEAR DOCTOR: On my return to the office, I find your letter of the 15th instant, also copy of Attorney Knight's opinion in relation to quarantine requirements.

I suppose I need not reassure you that our people are in full accord with you and the other members of the State Board of Health in your efforts to keep out the cholera, or, in fact, any epidemic that may threaten us. As I told you yesterday, I telegraphed to our agent at Yuma asking if Government buildings on the west bank of the Colorado River might not be utilized to your advantage, but learn that the buildings in question are occupied by the Government as schools for Indians; therefore, they could not be had.

As for cars, of course we will furnish them when required, but permit

me to suggest that during winter and summer it is usually so warm at Yuma as to make it more comfortable in tents, which I presume you would have no trouble in pitching, say a little out of Yuma; but should you require cars at this point, as you may at others, where it is colder, we would probably put in a spur track somewhere accessible to water. Fuel and provisions would, of course, have to be carried to the cars. Probably cars would be required this side of Reno, but up toward Ashland, the climate is milder. It is a question, however, whether you would quarantine on Oregon territory, unless you come down to the foot of the Siskiyou range, at some convenient point near water.

In this connection, do you not think it would be desirable to make the inspectors at these several entrances joint inspectors for California and the adjoining State or Territory, as the case may be? Such an arrangement might render your work more effective, and no doubt it could be made with the respective Governors.

However, as soon as you are ready and can indicate definite localities, we will, on your request, provide an emigrant car, containing bunks and stoves; also a freight car, where cooking may be done. Of course, you would be expected to furnish blankets and bedding; also necessary culinary articles, fuel, provisions, etc.

Probably it would meet your ideas to have your inspectors in close touch with our Division Superintendents in the localities referred to, and possibly the inspectors and the Superintendents, being on the ground, would be better able to fix upon particular localities for this work than either you or I. As I suggested yesterday, perhaps we could handle this epidemic as we have done during the smallpox scourge, or rather when isolated cases have been discovered, viz.: switch out the car with its passengers, as soon as the case was discovered, but permitting the remainder of the cars to go on to their destination; it might be claimed that the whole train should be quarantined, but from my talk with you yesterday, I am inclined to think you will look upon this matter purely from a thoroughly practical and reasonable standpoint; therefore, I would ask you to carefully consider what we have done in the past in relation to these things.

Remember, that in all these things we wish to work in harmony with you, and hope that you will feel free to communicate with us on all subjects at any and all times.

Yours truly,

A. N. TOWNE.

SOUTHERN PACIFIC COMPANY, OFFICE OF THE
SECOND VICE-PRESIDENT AND GENERAL MANAGER, {
SAN FRANCISCO, September 23, 1892.

Dr. J. R. LAINE, Secretary State Board of Health, Sacramento:

DEAR SIR: Many thanks for yours of the 22d instant and for the suggestion contained therein. I gave directions to have this matter attended to a few days ago, and will at once issue proper notice, if it has not already been done.

Hereunder I quote copies of two telegrams, from which it would seem that it would surely be the part of wisdom to adopt my suggestion of the other day—that is, either to have joint inspectors, or have a joint and

concerted action between the inspectors of California and the adjoining States and Territories:

LOS ANGELES, September 22, 1892.

To R. H. PRATT, *San Francisco*:

Dr. Cotter, California State Health Officer, cut smoker C. P. 1040 out of No. 20 at Ogilby to-day, occupied by fifteen passengers, on account of George B. Pope, one of the passengers, having bowel complaint, and W. H. Clark, a passenger from Gainesville, Texas, where dispatches say two deaths and four cases of cholera have occurred. The doctor asks us to send food for fifteen passengers and two deputies for twenty-four hours. Will the company furnish food?

(Signed)

J. A. MUIR,
Superintendent.

SAN FRANCISCO, September 22, 1892.

J. A. MUIR, *Los Angeles*:

Send an emigrant car and a car of water to Ogilby; also, provisions as requested by the doctor, and suggest to him that he confine the sick to the car they are now in, putting the others into the car you send. If you have no emigrant car at Los Angeles, will send you one from Tucson. Keep them supplied with ice. How soon can you get water car there? Answer.

(Signed)

R. H. PRATT.

To us it looks like a mistake to set this car out this side of Yuma, at a place where there is no water, or anything else to provide for these people. We hardly think the doctor had fully made up his mind what to do until he had left Yuma; for this reason, it would seem to be best to have a joint coöperation with the authorities of Arizona, New Mexico, and Nevada, in order that there might be an inspector on incoming trains, enabling the inspectors to locate suspicious cases before reaching the State line; especially would this seem to be desirable on the southern line, as Yuma would be the best place for the passengers, rather than to take them out on the desert, where the road runs for a long distance below sea-level; in fact, as far as 269 feet below at one point, and where the temperature is extremely oppressive. Such surroundings certainly cannot be conducive to recuperation of sick people.

A telegram just comes to hand that Dr. Cotter has released the car with its occupants, and permitted them to continue their journey. It would seem that he was a trifle hasty in this matter, and I do hope he will not subject passengers to any further unnecessary delay, for the reason that it will surely do the State very much harm, if reports are circulated that travelers are likely to be quarantined on the desert, if they should develop some slight affection of the stomach or bowels.

Yours truly,

A. N. TOWNE.

SOUTHERN PACIFIC COMPANY, OFFICE OF THE
SECOND VICE-PRESIDENT AND GENERAL MANAGER, }
SAN FRANCISCO, CAL., October 10, 1892.

J. R. LAINE, *Esq.*, *Secretary State Board of Health, Sacramento*:

DEAR SIR: Thanks for yours of the 5th instant. Our Superintendent at Los Angeles informs us that Dr. Cotter sent direct to you the bills for meals furnished quarantined passengers at Ogilby station, near Yuma, ordered through our people. In addition to this there was incurred the expense of three special trains from Yuma to Ogilby and return, on the 22d, 29th, and 30th of September. The cost of running trains on that division, owing to its isolation, great distance from fuel, supplies, etc.,

is greater than the average of our entire system; still, under the circumstances, I think it will be about right for us to base our charge for the service on the average cost, the accompanying bill being made on this basis. The charge for water and ice hauled out on the desert is taken from our regular rate sheets.

Trusting this will meet with your approval, I am

Yours truly,

A. N. TOWNE.

SOUTHERN PACIFIC COMPANY, OFFICE OF THE
SECOND VICE-PRESIDENT AND GENERAL MANAGER, }
SAN FRANCISCO, CAL., November 26, 1892.

Dr. J. R. LAINE, Secretary State Board of Health, Sacramento, Cal.:

DEAR SIR: Many thanks for yours of the 25th instant, inclosing check for \$154 50, drawn in my favor, for extra train, ice, etc., used near Yuma for account of the State Board of Health.

Yours truly,

A. N. TOWNE.

PHOENIX, ARIZONA, September 28, 1892.

Dr. P. G. COTTER, Medical Inspector California State Board of Health, Yuma, Arizona:

DEAR SIR: In reply to your letter and telegram from the State Board of Health of California (returned herewith) I have to say: That the authorities of Arizona do not consider it proper to permit the medical officers of California to establish a quarantine station in Arizona. While it is my desire to extend every courtesy compatible with propriety and a due regard for the interests of the citizens of the Territory, it would hardly seem proper and right, after travelers have crossed the entire Territory, to quarantine them on our frontier as they are passing out.

Under your jurisdiction you can detain suspects and diseased persons after they have crossed the river, and a wide stretch of uninhabited country lies between your station and populous parts of your State.

Yours respectfully,

N. O. MURPHY,
Governor.

LAW DEPARTMENT OF THE
STATE AND SAN FRANCISCO BOARDS OF HEALTH, }
SAN FRANCISCO, September 26, 1892.

Dr. J. R. LAINE, Secretary State Board of Health, Sacramento:

DEAR SIR: Yours of the 24th at hand. You ask if your honorable Board can spend the public money in taking care of suspects if, in the judgment of the State Board, it is better for the State's safety to locate them and their camps and camp equipage on the other side of the Colorado River.

I will state to your honorable Board that the object of quarantine and expenditure of public money being to protect our citizens from the epidemic, the Board of Health is invested with a large discretion in all these matters, and I see no objection to the Board using the money in any way that will protect our citizens. The only objection that could be urged is from the authorities in Arizona. If no complaint is made from that quarter, I unhesitatingly say that the money having been used for purposes of quarantine, *where* it was used cuts but little figure.

Respectfully,

GEO. A. KNIGHT,
Attorney for State Board of Health.

NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH,
SECRETARY'S OFFICE,
COLUMBUS, OHIO, August 27, 1892. }

Dr. J. R. LAINE, Secretary of State Board of Health, Sacramento, Cal.:

DEAR SIR: I have the honor to inform you that, at a meeting of the Executive Committee of the National Conference of State Boards of Health, held in Indianapolis August 26th, you were appointed a member of the Quarantine Inspection Commission, created by the committee. The other members of the Commission are: Dr. Baker, of Michigan; Dr. McCormack, of Kentucky; Dr. Watson, of New Hampshire; either Dr. Saloman or Dr. Holt, of Louisiana; Dr. Bryce, of Ontario, and Dr. Orvananos, of Mexico.

You are respectfully requested to make an inspection of all quarantine stations of the Pacific Coast, to note their equipment and efficiency of administration, and to report at the earliest possible date to Dr. McCormack, President of the Conference of State Boards of Health. It is suggested that a preliminary report is desirable soon, a complete report to be made at your convenience.

Expenses of the Commission will be refunded by the Conference.

Yours truly,

C. O. PROBST,
Secretary.

OFFICE CALIFORNIA STATE BOARD OF HEALTH, }
SACRAMENTO, September 12, 1892. }

Dr. J. H. McCORMACK, President Conference State Boards of Health, Bowling Green, Ky.:

DEAR SIR: In compliance with a request intimated to me by Secretary C. O. Probst, of recent date, informing me that I am expected to make an inspection of the quarantine stations on the Pacific Coast, I wish to make a preliminary report.

San Francisco Quarantine Station.—I visited the quarantine station on Angel Island, in San Francisco harbor, and find that it is equipped not only with the necessary buildings for officers and nurses, but that it has a water supply ample in quantity and excellent in quality. It has also a lazaretto for the accommodation of the sick, and barracks with tiers

of bunks sufficient for the accommodation of from five hundred to eight hundred Chinese or Japanese. The situation is in a natural cove on the northeast side of the island, well protected from the winds and admirably situated every way for the purpose for which it is intended. The disinfection apparatus is an improved Holt's, composed of three cylinders, each 40 feet long and 8 feet in diameter, supported by cast-iron saddles. The clothing and other effects are hung up by hooks inside, when heat and steam and sulphurous fumes are introduced. I was informed by the resident surgeon, Dr. Carmichael, that it is intended to build a hospital for non-contagious diseases, and also additional barracks. There is sufficient ground for a camp of several thousand people, if necessary. There is a ship in San Francisco harbor built by the Government for fumigating vessels. If this vessel were put into commission at once, San Francisco harbor might be pronounced by experts as being fully equipped to meet any and all emergencies. The State Board of Health have recently requested the Secretary of the Treasury, by resolution, to place this vessel in commission.

San Diego Quarantine Station.—I am informed by Dr. Carmichael, Resident Surgeon of the San Francisco Quarantine Station, and also by Dr. P. C. Remondino, member of the State Board of Health, from San Diego, that while there is a wharf at the site of the quarantine station at San Diego, and an officer or inspector for the Government in charge, yet there are no buildings or other accommodations for passengers that might be detained in quarantine, nor is there any apparatus or other appliances for the fumigation of their effects.

Port Townsend Quarantine Station.—I am also informed by Dr. Carmichael that the quarantine station at Port Townsend is in the same condition. They have a site and officers in charge, but no buildings and no apparatus for the fumigation of freight, baggage, or personal effects.

In view of these facts, and that ships from infected ports might at any time arrive and touch at these points, it has been deemed advisable by the State Board of Health to telegraph the Secretary of the Treasury to cause these stations to be equipped with approved appliances for disinfection and fumigation purposes. So far no reply has been received from the Secretary of the Treasury.

San Pedro Quarantine Station.—With reference to San Pedro, I append herewith, in full, a note from Dr. R. W. Hill, Contract Surgeon in charge of the Marine Hospital in San Pedro. It is unnecessary to comment further:

Dr. J. R. LAINE, Sacramento:

DEAR DOCTOR: I informed Dr. Cochran last week that I would serve as inspector for the Board, provided cholera should appear. Our city is now in a very good sanitary condition, owing to activity of our local Board in coöperating with myself in compelling cleanliness in all quarters. If you will refer to United States Collectors' statistics, you will see that we have far more shipping here than at any port south of San Francisco. The small coasters trading with Mexico, and Chinese junks, are a constant menace to health of all Southern California, by importing smallpox or other diseases from southern ports into this, the port of entry of Los Angeles. Our quarantine regulations and facilities are at present worthless. We have no pest-house or smallpox hospital. I have tents for use of Government cases only. The State should also have the same.

Yours truly,

R. W. HILL.

In view of the distance of California from the Atlantic seaboard, the attention of our State Board of Health has been directed mainly toward the matter of land quarantine and refuge stations at the points where

the railroads enter the State, because it seems as if cholera would be more likely to reach us by rail than by sea, unless it would first reach British Columbia by rail and then come down by vessel from Puget Sound; or first reach South America, Panama, or Mexico, and then come north by vessel to our ports.

The difficulties involved in making anything like an effectual land quarantine on our borders are enormous. An absolute quarantine, preventing all living things or matter from crossing our borders, or infected water from flowing down into our territory, must be put aside as impracticable. A relative quarantine—the inspection of passengers in transit; the detention of the sick in quarantine camps; the quarantining, for a limited period, of those who have been exposed to the disease; the fumigation of cars, clothing, and personal effects of those who have been exposed to cholera on a train—is at this time believed to be all that is practicable to do.

Our ability to detain passengers who have been exposed to the disease, at the refuge stations in a sparsely settled mountainous country, is viewed with some doubt, as without military guards around the camps there will be nothing to prevent them from scattering through the country.

We will, however, adopt such measures as we find available when the emergency arises.

It is my purpose to visit the quarantine stations at San Diego and Port Townsend at an early date, when I will report fully concerning them.

If you can offer further suggestions relative to an effectual land quarantine, I would be very glad to have you do so.

Yours very respectfully,

J. R. LAINE,
Secretary State Board of Health.

CONNECTICUT STATE BOARD OF HEALTH,
SECRETARY'S OFFICE,
NEW HAVEN, CT., September 15, 1892. }

J. R. LAINE, *Secretary California State Board of Health:*

DEAR DOCTOR: I shall feel highly honored to have you use the circular on cholera in the way you propose.

Very respectfully,

C. A. LINDSLEY,
Secretary.

The circular is as follows:

RESTRICTION AND PREVENTION OF CHOLERA.

[Circular No. 4 of the Preventive Disease Series of the State Board of Health.]

So long as cholera continues to spread over Europe, in spite of the persistent efforts to arrest its progress, the United States cannot feel exempt from the danger of its introduction.

Ordinary prudence dictates the propriety of taking such precautions as will reduce the chances of its invasion to the minimum, or, failing to prevent its invasion, to adopt such measures in advance of its approach as will to the utmost restrict its spread.

To prevent its admission among our people, will depend chiefly upon the vigilance and intelligent activity of health officials at the ports of entry.

To restrict its spread after the disease has gained a lodgment, will depend upon the people and upon the local Boards of Health.

In view of the present situation, the people of California and the Health Officers of towns cannot be too prompt and energetic in taking such measures as are best calculated to resist this dreaded foe. While it is possible that a visitation of cholera may be escaped this year, it is the part of wisdom to be prepared. If all reasonable precautions have been taken, the public will be less likely to be seized with that unreasoning fear and panic that predisposes to the disease and is a powerful adjunct to its spread. It is also true that all sanitary improvements are of lasting benefit, and if we now escape this disease, the results of the sanitary work accomplished will be seen in a better state of public health, less sickness, and a lowered death-rate.

The value of action before disease appears is beyond all comparison greater than that taken in the presence of an epidemic. Public safety will be best secured by such preparation as is known to be the most effective, before the approach of the foe. Fortifications cannot be erected while under the fire of the enemy. The sanitary barriers which defend from fatal disease are much the same, whether it be Asiatic cholera or any other infectious malady. The watchword of protection is *cleanliness*. If we make ourselves clean and our surroundings clean, the cholera may come, but it will fail to find an abiding place.

What to do will be best understood by knowing how cholera is communicated.

Cholera is not contagious in the same sense that scarlet fever and smallpox are contagious; it is not what is commonly called "catching." If disinfection and other proper precautions are used, there is scarcely any risk that the disease will spread to those that nurse, or otherwise attend closely upon the sick. It is the present belief of scientists that it is always communicated by a specific infection—a living germ, known as the *coma bacillus*. Every precautionary effort has relation to preventing the propagation of this germ and to its destruction. The disease cannot exist unless the germ exists. Nor can the disease occur unless the germ gains access to the *intestinal canal*. All measures of prevention are based on these facts.

The evacuations of a cholera patient contain the infecting germ. This is its primary source.

The cholera germ can be reproductive outside the human body under favorable conditions. Vile, filthy, undrained or unsewered tenements, filth-saturated soil from leaky drain-pipes, an atmosphere reeking with the gases of decay, soil polluted with the putrefactive compounds from garbage, kitchen slops, sink-drains, overflowing privy vaults, and the overcrowded haunts of vice and crime, in which misery compels the poor also to seek shelter, furnish in the most inviting form the essential conditions for the re-propagation of the *contagium* of cholera. Less aggravated instances of unsanitary conditions are proportionately dangerous. A warm, moist atmosphere, into which putrefying organic matter is discharging the gases of decay, is favorable to the development of the germs of cholera. The water from wells polluted by filth from closely-adjacent vaults or drains, and other sources of water supply

defiled by sewage, if also infected with the specific contagion of cholera, has long been recognized as one of the most active agents in the spread of this disease.

Dr. Shakespeare, in his recent report to the United States Government on cholera in Europe and India, says that the spread of the disease after its introduction into a locality is "universally associated with contaminated water supply, filthy habits, and bad personal and domestic hygiene." Hence it is one of the "filth diseases."

With such knowledge of the disease the measures of prevention are obviously both general and individual.

The *general* measures should engage the attention of Health Officers, whose duty it should be to enforce the highest standard of public hygiene practicable. A systematic and thorough sanitary survey of all premises within their respective jurisdiction should be made. All nuisances dangerous to the public health should be promptly abated. The milk supply and water supply, those common carriers of infection, should receive their special attention. The markets should be inspected with reference to the quality of food offered for sale. Notice should be taken of every known means by which it would be possible, if a case of cholera should occur in their locality, that the evacuations of the sick containing the infection might reach the intestines of another susceptible person.

In the event of cholera appearing in a town, the Health Officer should provide for its care by isolating the case, with proper attendance, and by taking such action as will insure without any doubt the thorough disinfection of all the excretions of the patient. *This is the one essential thing above all others which he should be sure to have performed.* If the disinfection of all the excrementitious discharges of the patient is thorough there can be no spread of the disease from that case.

Health Officers should also keep under observation all newly arrived immigrants, until such time after their arrival that the incubation period of any infectious disease shall have expired.

The *individual* measures of precaution relate to the conduct of the person. The tendency to infection varies among individuals.

The normal acid juices of the stomach can destroy the infection. But if by any indiscretions of diet or other influence the digestive powers are impaired or enfeebled, and the cholera germ is not destroyed in the stomach but passes on into the duodenum, where there is an alkaline reaction, great multiplication of the germ becomes possible, with elaboration of the poisonous ptomaine and establishment of the disease.

Hence the importance of regular habits of life of careful preservation of good digestive powers. Particularly avoid drinking large quantities of water *between* meals, because between meals a neutral reaction of the gastric juices exists, and the protective effects of *acid* gastric juice against the bacillus is lost.

"Experience has abundantly proved," says Dr. Shakespeare, "that two laws have an important bearing upon the spread of cholera: (1) The tendency to infection varies exceedingly among individuals, and is with the vast majority exceedingly small. (2) Disturbed conditions of the digestive apparatus greatly increase the susceptibility of an individual and render him far more liable to an attack after exposure to the infection."

The personal precautions are few and simple: (1) A plain nutritious

diet. (2) Meals at regular hours. (3) Indulge in no excesses of eating or drinking, especially of alcoholic stimulants or ice water. (4) Never eat without first washing the hands. (5) Avoid high excitement, great fatigue, and taking cold, and keep cheerful.

Persons who are in vigorous health and lead cleanly, regular lives rarely take cholera. Its victims are mostly among the dissipated and the dirty.

Finally, the thorough boiling of milk or water before using it, while cholera is prevailing, is never to be neglected. In the presence of an epidemic, all food should be eaten freshly cooked, because heat kills the infection.

Our control over the spread of cholera is complete, as the laws which govern it are so well understood. Were it not that from neglect and indifference, unsanitary conditions have been, and are, allowed to become so extensive and complicated that they cannot at once be remedied, there would be no reason to fear this scourge. The contagion of cholera can be destroyed, whatever its essential nature may be, and the disinfectants that destroy it are well known and easily used. The factors for an epidemic of cholera are: (1) The specific contagion; (2) Moisture and warmth; (3) Filth.

If the specific contagion be not excluded by quarantine it can be destroyed by disinfection. The filth factors can be removed or purified. While warmth and moisture are essential for the multiplication of the germs, they can be preserved for an indefinite time in a dry state, and again become active if the proper conditions for their development are supplied. The limits of the contaminated area mark the boundary of the spread of cholera. With pure air, pure water, and an uncontaminated soil, an epidemic of cholera could not be developed. The nearer this standard is reached, the less the danger from cholera. Sporadic cases might, indeed, occur by importation of the infection, but the disease would be readily controlled. Cholera is a stern teacher of the importance of public hygiene. It is "the world's great nuisance-searcher, as well as a relentless destroyer, silently invading and smiting the people that have left open the door for such visitation."

The most certain disinfectant is fire. Hence all articles of small or no value should be burned, in the room, if practicable, in the stove, or, better still, in an open fireplace. Fire is infallible.

Articles of value which can be washed, such as bedding, soiled underclothing, etc., should, immediately they are not needed for use, be immersed in a disinfectant solution for four hours, after which they may be subjected to the usual processes of the laundry, namely, boiling, washing, airing, ironing. Garments of wool or silk, which would be injured by wetting, can be disinfected by exposure to dry heat at a temperature of 230° F. for two hours. This is not usually practicable, except in a disinfecting oven constructed for the purpose. But they may be exposed to the strong fumes of burning sulphur for twelve hours without injury.

Mattresses, pillows, and padded blankets, if much soiled by the discharges from the patient, cannot be easily disinfected, except by fire, and had better be burned.

In nursing the patient, clean, soft, white rags should be used, instead of handkerchiefs, for wiping away infectious discharges, and thrown at once into the fire.

The following upon disinfection is extracted from the report of a committee to the American Public Health Association:

For Excreta.—(1) Fresh chloride of lime in solution, 4 parts to 100.

(2) Corrosive sublimate, }
Permanganate of potash, } of each $\frac{1}{4}$ of an oz. to a gallon of water.

Of either of the above solutions a half pint or more should be placed in the bedpan or chamber-pot, before the patient uses it. They should remain mixed two hours before the vessel is emptied.

For Soiled Clothing, Bedding, Etc.—(1) Destruction by fire.

(2) Boiling at least one half hour.

(3) Immersion for four hours in a solution of corrosive sublimate, 1 part to 2,000, *i. e.*, about 30 grs. to a gallon of water.

(4) If injured by immersion, may be disinfected by dry heat or by fumigation, as mentioned above.

For Furniture and Wooden, Leathern, and Porcelain Articles.—Washing repeatedly, while used in the sick room, with—

(1) Corrosive sublimate solution, 1 part to 1,000 of water; that is, 60 grains to the gallon.

(2) Solution of fresh chloride of lime, 1 part to 100.

(3) Solution of carbolic acid, 2 parts to 100.

For the Person.—For washing the hands and the general surface of the body of the nurses and of the convalescents, when changing their clothing to leave the sick room, either of the above solutions of chloride of lime (2), or of the carbolic acid (3), or the solution of chlorinated soda, diluted with 9 parts of water (1 to 10).

For the Dead.—Envelop the body in a sheet thoroughly saturated with either of the following:

(1) Chloride of lime in solution, 4 to 100.

(2) Corrosive sublimate in solution, 1 to 500.

(3) Carbolic acid in solution, 5 to 100.

For the Sick Room.—(a) While being occupied, wash at intervals all surfaces with one of the same solutions recommended for the furniture.

(b) When vacated: Fumigate by burning four pounds of sulphur for every 1,000 cubic feet of space in the room. Before doing this, close up the room as tightly as possible; stop every crack and crevice, even to plugging the keyhole. After twelve hours throw open the doors and windows, and ventilate freely. Then have all the surfaces washed with one of the solutions for furniture, and afterwards with soap and hot water.

For Disinfecting Privies, Garbage Heaps, Cesspools, Drains, and Other Offensive Places.—Fifty pounds of copperas (sulphate of iron, green vitriol) to a barrel of water, or $1\frac{1}{2}$ pounds to a gallon.

It may be used freely, and repeated as often as odors arise. It is cheap and efficient. About four gallons are required to disinfect an ordinary vault used by one family. A smaller quantity may then be poured in occasionally.

For Sink Pipes and Water-Closets.—One pound of nitrate of lead to a gallon of water. Use freely.

Note.—There are a large number of proprietary “disinfectants,” so called, in the market. Most of them are simply deodorizers or antiseptics, of perhaps some value to stop a stink, but are entirely untrustworthy for disinfectant purposes.

OFFICE OF NEW YORK BOARD OF TRADE AND TRANSPORTATION, }
NEW YORK, December 5, 1892. }

Dr. J. R. LAINE, Secretary State Board of Health, Sacramento, Cal.:

SIR: At the request of the Committee on Quarantine, I inclose herewith a printed circular which will explain itself. The committee will be indebted to you for an expression of your views on the subject referred to, as they believe such views as you may give will be of much value to them in their investigations.

DARWIN R. JAMES,
Secretary.

ROOMS OF NEW YORK BOARD OF TRADE AND TRANSPORTATION, }
NEW YORK, December 5, 1892. }

A Special Committee of the New York Board of Trade and Transportation has been appointed, pursuant to resolution, and is seeking information, data, and opinions touching quarantine, and the advantages, if any, of establishing a uniform system in the United States, under the management of the General Government; the intention being, if the weight of opinion and evidence favor the proposition, to prepare suggestions for congressional legislation on the subject.

The members of the committee are: Chairman, Hon. Oscar S. Straus (ex-U. S. Minister to Turkey), of L. Straus & Sons, importers of china, glass, etc.; Mr. Jeremiah Fitzpatrick, of J. Fitzpatrick & Co., importers and manufacturers of plate glass, looking glass, etc.; Mr. Edward H. Cole, of The Eaton, Cole & Burnham Co., well machinery and brass goods; Mr. Elias S. A. De Lima, of D. A. De Lima & Co., foreign commission merchants; Mr. Ambrose Snow, of Snow & Burgess, shipping and commission merchants.

The committee have adopted the following line of inquiry, and invite such suggestions and opinions thereon as they may be willing to make public, from experts and professional men having practical experience in sanitary affairs, and from others having opinions on the subject:

First—Quarantine administration in foreign countries as furnishing precedents for the United States.

Second—The present status of quarantine in the United States: (a) National; (b) State.

Third—The existing system of quarantine administration in the United States: (a) Cost; (b) Restrictions imposed on commerce and travel; (c) Security afforded.

Fourth—A national quarantine: (a) Would it lessen the existing imposts upon commerce? (b) Would restrictions on commerce and travel be less injurious? (c) Would it afford increased security to the country?

Persons writing the committee are requested to affix to their names their professional or special titles, if any, and to address their communications to Hon. Oscar S. Straus, Chairman, 55 Liberty Street, New York, N. Y.

Respectfully, etc.,

DARWIN R. JAMES,
Secretary.

OFFICE CALIFORNIA STATE BOARD OF HEALTH, }
SACRAMENTO, December 26, 1892. }

Hon. OSCAR S. STRAUS, Chairman Special Committee of New York Board of Trade and Transportation, No. 55 Liberty Street, New York City:

SIR: In reply to questions one to four, propounded in a circular relating to quarantine accompanying a letter signed by Secretary Darwin R. James, I will say that the first question might properly be passed by without discussion, inasmuch as the establishment of any kind of quarantine has for its only object the protection of the people of the United States and those who act in conjunction with them. The study of quarantine administration in foreign countries will be instructive, but it should not be prosecuted with a view merely to finding precedent for our future action on this continent. It would be well to divest ourselves at once of any leaning or dependence on other countries, and to adopt a course best suited to our present and future necessities.

I would, however, call your attention to Dr. Shakespeare's very com-

prehensive and voluminous report to the President on this subject, with special reference to Asiatic cholera.

The present status of quarantine in the United States is mixed, being partly national and partly State. Each is distinctly separate and different in function, but identical in purpose and interest. Under the present system there must of necessity be a want of uniformity of administration, with weakness at points in the line of defense. Such uniformity of administration as would bring all defensible points to a parallel degree of efficiency cannot be too strongly urged; but this cannot be put into successful operation while it is possible for the State and national authorities to conflict.

The national quarantine administration is under the management of the General Government, through the Treasury Department, which delegates it to the Marine Hospital Service. Its efficiency has so far been unquestioned, and it has everywhere met the full expectations of the public where it has been invested with means and authority to act. It has the positive advantage of mobility, which the State authorities cannot possess. Any want of suitability of local administration may be corrected by a change of station, which is impossible in State and municipal affairs. The cost of the Marine Hospital Service may be ascertained in the United States Treasurer's report.

The restrictions to be imposed on commerce and travel would, it is hoped, be increased rather than diminished under a national administration, inasmuch as security to ourselves is the prime object of quarantine. But the asperities of such restriction might and should be reduced, so as to bear as lightly as possible, by the establishment of suitable refuge stations, the separation of the sick from the well, and the detention of suspects in isolated and commodious quarters. But the restrictions on commerce and travel should cover a wide range. It should, under certain conditions, to be determined by competent authority, be absolute. A total suspension of commerce and travel for a time would prove less injurious to commerce itself than the presence of an Asiatic pestilence for the same period. Add to the injuries to commerce the injuries to national prosperity produced by an unsettled and panicky condition of the public mind, and the financial results are appalling and far-reaching in their ultimate effects.

A national quarantine system under the control of the General Government would undoubtedly lessen the existing imposts on commerce, and also modify advantageously the restrictions on commerce and travel. It would most certainly afford increased security to the whole country. There would be the decided advantage of uniformity of administration under the central authority of the Government. Such deviations as were found necessary at the point of action could be provided for. But the laws under which the restrictions are applied would be known at home and abroad, and all requirements would be weighed and anticipated. Duplicity and want of good faith are less likely to be found in an officer of the General Government than in the State and municipal appointee, whose brief official tenure is obtained through political influence, which hampers him with a sense of personal obligations that he cannot evade without ingratitude. Add to this the multiple and heterogeneous duties of a Health Officer in one of the large cities, and it need not seem unreasonable that the great mass of people remote from the seaboard view the situation with alarm and apprehension. For it must be generally under-

stood that a careless, inefficient, or corrupt State or municipal administration of quarantine at any point along the borders may endanger all.

There can be no doubt but that the Government officer placed at his station, and invested with authority to perform specific functions, will have the confidence and moral support of the people of the interior; while the State and municipal officer, no matter how capable and high-minded he may be, cannot have equal confidence and support. There must also be considered the moral aspect of the question, the question of right. The interior claims by right that our national defenses shall be made sufficient. If a foreign enemy were to invade our shores or borders, no one questions the right of all the States to repel the invaders. How much greater is their right to demand that our shores and borders shall be guarded against an invasion that is terrible and loathsome. This is not a question that admits of sentimental considerations.

The authority of the General Government may be applied to all matters of a national system of maritime and interstate quarantine, without trending upon the rights and prerogatives of States to manage their own local affairs. But a State or municipality has no greater moral right to use its powers in such a way that other States shall suffer, than has the individual. There inheres in the National Government a police power for national purposes, in the State Government for State purposes, and where delegated to county, city, or town, for local purposes. There are times when the vigorous exercise of this police power must be invoked for the protection of society. This power, which is the essence of all social order, may not be evaded or relinquished. The citizen of an interior State has the same right to invoke the general police power of the National Government for protection against an invasion of cholera, as he has to call upon his local Health Officer to abate a local nuisance. Will a rich, intelligent, and powerful country continue to jeopardize its prosperity by a trustful faith in the ability of any local government to act for the whole people? Is it just to impose upon the local government the enormous cost of such quarantine? With a full knowledge of the power of local politics and meretricious influences, is it wise to leave our defenses entirely or even partially in such hands? It would seem wiser to invoke the authority of the United States, backed by its treasury, and to inaugurate a uniform system of national maritime and interstate quarantine. That such a system would afford increased security, cannot be successfully contradicted. That it would have the confidence of the people there can be no doubt.

The matter of commerce might be so adjusted that only such lines as are least capable of carrying infecting germs shall be transported during seasons of danger, but there should be scope in the laws for a total and absolute inhibition of all commerce, if the exigency for such an extreme measure shall arise.

I believe that the placing of capable and trustworthy medical inspectors at all infected foreign ports would be of first importance. Their authority should be superior to officers of customs and shipping agents, who should not be permitted to issue clearance papers until after a full compliance with the requirements of the medical inspector. A report by cable would vouch for the condition of vessel, crew, passengers, and cargo, when leaving port.

An absolute inhibition of travel and commerce with any port that

refused to comply with imposed conditions would narrow the quarantine service to practical proportions.

Very respectfully,

J. R. LAINE, M.D.,
Secretary California State Board of Health.

OFFICE CALIFORNIA STATE BOARD OF HEALTH, }
SACRAMENTO, January 29, 1893. }

L. A. ELSTER, M.D.:

SIR: You are hereby appointed Special Inspector for the California State Board of Health, to investigate the spread of smallpox in San Luis Obispo and vicinity, also at San Francisco and Sacramento.

You will at once proceed to San Luis Obispo and consult and advise with the local health authorities, and ascertain if due precautions are being taken to restrict the spread of the disease in each case that is known to exist, and to report, in detail, the preventive measures adopted. You will also impress upon the local health officials the necessity of complete isolation of the sick, and a prompt vaccination of all who have been exposed to the contagion. You will proceed beyond San Luis Obispo to such other localities as authentic reports show your services necessary in that direction, and report at your earliest convenience such cases as you may gain knowledge of. On your return you will stop at San Francisco and consult Dr. Jas. W. Keeney, Health Officer, and obtain exact information as to the number of cases existing in that city, and how many have occurred since the first outbreak.

You will then return to Sacramento and investigate the cases known to be there.

J. R. LAINE,
Secretary State Board of Health.

SAN LUIS OBISPO, CAL., February 3, 1893.

Dr. J. R. LAINE, *Secretary State Board of Health:*

DEAR DOCTOR: I am happy to state that at the present time the local authorities have taken all possible means to prevent further extension of smallpox in this town and vicinity, and that there is now no danger of the disease being communicated to persons visiting the town. I have talked with Dr. Snow by telephone, and he assures me that they have no cases there, and have taken all necessary precautions. It is reported here that there are or have been some cases at Santa Cruz, and I will stop there on return trip. In justice to the people of San Luis Obispo, the present situation ought to have as wide publication as practicable, as the business of the town is suffering from exaggerated reports which had a basis in the truth, but are likely still to be repeated and further exaggerated. The general sanitary condition of the town is being improved, and in that way the panic will be quite an advantage.

Every courtesy has been shown me, as representative of your Board, and I shall be able to make a very full report of the source of the infection and history of the cases which have occurred. I have visited the

railroad camps where the first cases appeared, and find them now in good condition, and no cases there now but a case which is probably one of smallpox, which I recommended the surgeon to have removed to the hospital here as soon as a proper arrangement can be made with the Board of Supervisors. On return here I consulted the physician in charge, and the resident member of the Board, who expressed their willingness to do as suggested, so that I hope the patient will be brought here to-morrow evening, at which time the smallpox ward will be vacated by the three convalescents now there, and the ward cleansed, so that no danger will be incurred by the patient should he prove to be not already infected. There is, however, a strong probability that in the next forty-eight hours he will show the eruption.

The local daily of to-morrow will be sent you, and the Health Officer will make reports of any new cases. I expect to take the stage early to-morrow morning, and be in San Francisco by Monday or Tuesday. My address there will be The Irvington.

Very respectfully,

L. A. ELSTER, M.D.,
Special Inspector, State Board of Health.

QUARANTINE CONFERENCE WITH ARIZONA.

The State Board of Health of California had congratulated itself that an admirable location for a quarantine station had been selected at El Rio, near the dividing line between California and Arizona, within a few miles of Yuma, A. T. Very soon the Board was compelled to meet so many objections from residents of Yuma, and persons very much interested in the welfare of the Indians at the Yuma Reservation, that it was decided as advisable to abandon the location selected and seek another. While in doubt as to where the best place for that purpose could be found, a letter was received by the President of the Board from A. N. Towne, General Manager of the Southern Pacific Railroad, who had always taken a very lively interest in the matter of quarantine selection, offering every facility and assistance possible to the Board, stating the very pleasing fact that the Governor of Arizona had become very much interested in the matter of joint and mutual protection from invasion of contagious disease by California and Arizona, and had appointed Dr. Goodfellow Territorial Health Officer, with full power to make any arrangement with California that would be acceptable to both, and requested that I appoint a time and place for holding a conference for the full discussion of the subject of joint quarantine. Accordingly, I appointed Colton, San Bernardino County, as the place, and June 14, 1893, as the time. I was very fortunate in obtaining the presence of Dr. J. H. Davisson, of Los Angeles, a member of the State Board, who rendered me valuable assistance with his counsel and advice; also, Dr. M. F. Price accepted an invitation to be present, and assist me with his full knowledge of that section of the country wherein a detention hospital probably would be located.

We met Dr. Goodfellow at Colton, accompanied by Hon. Judge Wright, of Arizona District Court. Judge Wright was chosen as presiding officer and Dr. Price as Secretary of the convention. A free and

full discussion was entered into by the representatives of California and Arizona, resulting in a perfectly complete harmony of proposed action.

While California and Arizona would each act for its own protection, there would be such a unity of action as to greatly increase the protective influence of interstate quarantine. During the year previous to this conference a lack of confidence existed in the California State Board of Health as to the security of quarantine on our southeastern border, occasioned by what was considered at that time an unpleasant, apathetic indifference on the part of our neighbor. But now I am pleased to be able to congratulate the Board with the fact that that feeling has been entirely and totally dispelled by the hearty and enthusiastic coöperation of Arizona with California, both looking forward to the same end—namely, united, harmonious interstate protection from contagious disease.

It also affords me much pleasure to be able to congratulate the Board on account of the excellent arrangements completed all along our border for protection from invasion of disease. From Albuquerque, New Mexico, and from El Paso, Texas, through Arizona on lines of Southern Pacific Railroad and Atlantic and Pacific Railroad; from Sacramento to Ogden, Utah, by Central Pacific Railroad, and to Seattle, Washington, by California and Oregon and Northern Pacific, necessary arrangements are so completely made as to require only a very short time to put the entire system of protection in operation. Governor Colcord of Nevada, at a recent interview, heartily concurred in all of our efforts in that direction, enthusiastically coöperating with the Board in any movement for our mutual protection. We had the pleasure of an interview with a representative of the Atlantic and Pacific Railroad, who cheerfully offered any assistance in his power to increase the efficacy of our plan of procedure. After a free interchange of opinions as to sanitary matters, which no doubt were of benefit to all, the conference adjourned *sine die*.

Upon advising with Dr. Davisson as to the selection of a location for a detention hospital at some point embracing most of the necessary qualifications for the purpose, I decided to request Dr. M. F. Price, at his earliest convenience, to take charge of such duty, and to report to me as soon as he had arrived at a definite conclusion. I selected Dr. Price on account of his large experience and great knowledge of that locality, and his good judgment displayed on other occasions of similar nature. His report is herewith appended.

Respectfully submitted.

C. A. RUGGLES, M.D.,
President State Board of Health.

OFFICE OF HEALTH DEPARTMENT, SAN BERNARDINO COUNTY, }
COLTON, CAL., June 23, 1893. }

C. A. RUGGLES, M.D., *President State Board of Health, Stockton, Cal.:*

DEAR DOCTOR: In compliance with your instructions, I went out to White Water and Cabazon yesterday to look the ground over with reference to a suitable place to establish a quarantine station, should it become necessary. White Water Station may be eliminated from consideration, as it is entirely unsuitable. It is a bleak and sandy desert,

with a universally high wind prevailing, in which it would be almost impossible to spread tents and keep them standing. Cabazon is better situated, and is the only place at all suitable for a quarantine station on the road beyond Banning. It is six miles from Banning, on the Southern Pacific Railroad. There is plenty of good water, there being two sources of the supply: one from an open ditch, which supplies two or three ranches, and the other from the railroad supply, which is in pipes. The quarantine camp could be established to the eastward (the prevailing winds are always from the west) and below the station and ranches, and a ditch cut to it, or a pipe connected with the railroad company's pipe to the camp. There is wood in the vicinity, but it would probably be easier and less expensive to ship it from Banning. All needed supplies could easily be shipped to that point. Provisions could be obtained at Banning, ice from Colton, or all brought from Los Angeles without much delay.

I do not know of anything else to say in reference to it, as this is about the information you desire. I went to Banning and got a team and drove down to these two points, so I had a good opportunity to see the situation and decide the matter on its merits. Now, if there is any further information you may wish, of course you will write me. It was impossible for me to go out any sooner, owing to being a witness in a case in the Superior Court. If it is decided to locate the station at Cabazon, it might be well to have the tents shipped out to that point; I think you said they were at Yuma.

Keep me fully informed as to the situation down here, and post me as to what will be required, in case the emergency arises.

Sincerely yours,

M. F. PRICE.

SANITARY INSPECTION OF STATE INSTITUTIONS IN SOUTHERN CALIFORNIA.

Mr. President and Members of the California State Board of Health:

At the regular meeting of the California State Board of Health, in Sacramento, January 15, 1894, a deputation or committee, consisting of the undersigned, was delegated to make an official and thorough sanitary inspection of the various State institutions located in Southern California and the National Quarantine Station of the United States Marine Hospital Service at the port of San Diego, Cal.

STATE NORMAL SCHOOL AT LOS ANGELES.

January 17th, we visited the State Normal School at Los Angeles, where we were received by Prof. E. T. Pierce, the Principal, and Professor Dozier, both of whom extended courtesies and accompanied us through the institution during school hours, and we noted the many sanitary imperfections connected with the original or old building, viz.: the lack of a proper system of ventilation or air currents through the building to remove the impregnated and dead air from the recitation-rooms, which, it is hoped, may soon be remedied by the fan system of ventilation; also the antiquated and unsafe condition of the subsoil pipes of the original building—of cement, and broken—which should be replaced as soon as possible by iron pipes to avoid serious trouble from leaks, which may occur at any time, and fill the buildings with sewer gas. In this building there are yet to be seen some of the old plunger closets, which, very properly, are soon to be replaced with modern sanitary tank closets, and the lavatories and plumbing generally in the building improved. These unsanitary conditions are a menace to the health and vigor of about four hundred intellectual, ambitious, but not always rugged individuals, whose hygienic conditions and environment should be all that modern engineering skill and sanitary science can afford, to fit them for teachers in the schools throughout the State of California.

A large addition is in course of construction, which will be ample for the present demands of the school. It is a substantial three-story brick, with a fine basement, and adjoins the original building on the west. It is to be equipped with the modern sanitary fittings necessary, and will cost about \$70,000.

We had the pleasure of meeting Mr. J. A. Preston, of the firm of Preston & Locke, architects, who designed the building, and also Mr. O. J. Muchmore, the most competent Superintendent of Construction, both of whom kindly went over the plans with us. The new building is to be supplied with the "fan system" of ventilation, which should be also extended and applied to the old buildings as soon as it can be accomplished.

The gymnasium, a wooden building, recently constructed, is west of the other buildings, and apart from them, and is well appointed and adapted to the needs of such a school.

The location of all these buildings, upon high and dry ground, gives the advantages of pure air and plenty of sunshine, so essential to an institution of this character. There is an abundant supply of pure water from the City Water Company's waterworks.

The Arroyo de les Reyes, a natural waterway, aligns this school property for several hundred feet, and this portion of this natural storm-water drain has not been piped, and while the large amount of storm-water does not materially damage the property of the State, it floods Hope Street and residence property in the neighborhood, and as a matter of justice, the State should contribute to this much-needed improvement. Dr. L. M. Powers, Health Officer of the city of Los Angeles, called my attention to the matter, and it is a subject to be presented to the Board of Trustees for their consideration.

WHITTIER STATE SCHOOL.

January 18th, we visited the Whittier State (Reform) School, accompanied by Dr. W. G. Cochran, ex-President of the California State Board of Health, and at present a member of the Board of Trustees of the Whittier State School. We were met by the Superintendent, Dr. Walter Lindley, and his assistant, Mr. Coffin, and lady, the Matron, all of whom gave us every opportunity for thorough inspection of the institution in all of its departments. The school is well located on high ground, which gently slopes toward the ocean, and near the low hills of the Coast Range of mountains, and far enough inland for the sea-breeze to be tempered so that it is pleasant throughout the year. The grounds are ample, and every attention has been given to hygiene in the buildings constructed; and no better evidence of the successful endeavors of construction and management can be offered than the records of the institution, showing the uniform good health of the pupils and the very low death-rate, which is almost nil. There are at present 340 boys and 70 girls in the school; and the two departments, male and female, are located a mile apart. The building for permanent quarters for the girls' department is now being constructed with regard to the urgent needs of the school, and is to be fitted with all modern and hygienic fixtures essential for comfort and convenience. Every pupil attends school three hours daily, and works four and one half hours daily in one of the industrial departments of the institution. Their industries are varied, and the pupils are placed in accordance with their fitness for the various industries. There is a shoe factory, where all the shoes worn by the inmates are made; a tailor shop, where all the clothing is made; a printing office, fully equipped and run by a number of boys learning the printing business; an electric department, where twenty-one boys, under the direction of Engineer Wiggins, are learning electrical engineering, and generating heat, light, and the power for the entire institution. There are also large classes in carpentry, blacksmithing, baking, type-writing, farming, gardening, dairying, and many in the steam laundry, paint shop, and some studying stenography, while many others are at horticulture, etc. With one hundred and sixty acres of fine productive land well supplied with water, their opportunities for industrial pursuits to fit them for lives of usefulness are all that could be desired. There is a fine musical organization of eighteen pieces, a drum corps, and seven military companies.

The Whittier State School, under its wise and unselfish Superintendent, who puts his whole life into the work, is a model of its kind; and the endeavor of the management to rid it of the odium of a penal institution, and inspire its pupils with all that is essential to scholarship, industry, and manhood, and thus fit them for important positions—which are in many instances now filled by those who have gone forth from the school—should receive the earnest support and commendation of all fair-minded citizens, as many of its inmates are very young and bright children, who are evidently not there for criminal offenses, or because they are incorrigible, but because they, for various reasons, have no adequate homes or proper parental care. This is one of the best reasons for ridding the school of the odium of a penal institution. The change is in the interest of humanity, as it is a misfortune and a blot upon our civilization to stigmatize the lives of these little homeless children by sending them to a reform school. We are pleased to state that since our official visit the sculptor's chisel has removed the ominous and odious legend, "Reform School," from the portals, and substituted the name "Whittier State School" instead—that the future of these little waifs may not be forever smirched for the sins and misfortunes of others.

ASYLUM FOR INSANE AT SAN BERNARDINO.

January 19th, accompanied by Dr. M. F. Price, of Colton, we visited the Asylum for the Insane at Highlands, San Bernardino County, where we were cordially received by the Superintendent, Dr. M. B. Campbell, and his assistant, Dr. A. S. Dolan, both of whom accompanied us through every department and ward of the institution. The asylum is located on high, sloping ground, near the foot of the San Bernardino Mountains, and is a substantial brick structure, with rather economical finish, but well planned for pure air and sunshine. The building is ventilated by the "fan system," economically applied, and run with a water motor, except during the very dry season, when an electric motor is utilized. The building is comfortably heated throughout with registers communicating with steam radiators; it is supplied with modern sanitary plumbing and fittings, and automatic flush-tank closets, and lavatories are arranged for the convenience of the various wards. The water supply is not as abundant as it should be, though there is a fair prospect that more water can soon be developed to answer the increasing demands of the institution and meet the requirements of the future.

The sewage, after passing through settling tanks or basins some distance from the asylum, is being utilized for irrigation on the farm, without any objectionable features as yet.

The asylum is clean, light, and cheery, and the beds and bedding are in good condition. The food supply is abundant and of good quality.

There are 170 patients now in the institution, and it will soon be overflowing, as it is filling up at a rapid rate. It will be necessary to extend the building, as the plans contemplate, to accommodate the immense number of these unfortunates, often thrust upon this section of our State, and many of whom have records of mental alienation in the East and in foreign countries prior to coming here. The means of restraint for the most violent patients are modern and in harmony with advanced civilization.

The institution in all its bearings presents the appearance of proper

discipline, and is kept neat and clean under the apparently economical management of Dr. Campbell.

Since our official visit the asylum is filled to overflowing, there now being about 200 patients, some of whom are cared for outside of the asylum proper.

QUARANTINE STATION AT SAN DIEGO.

January 20th, accompanied by Dr. P. C. Remondino, member of the State Board of Health, and Dr. Magee, Health Officer of San Diego, we visited the national quarantine station of the port of San Diego. We were courteously received by Dr. W. W. McKay, Acting Surgeon of the United States Marine Hospital Service, in charge. The station is admirably located for the purpose, on the west side of the bay of San Diego, near Point Loma, but lacks as yet the three essentials of a complete station, viz.: the steam sterilization or disinfecting chamber, the sulphur fumigation apparatus, and barracks for cabin passengers, in case of detention. The Government has judiciously expended \$52,000 in the construction of the wharf and the various buildings which constitute the station, including their outfitting and a most complete sewer system. The hospital, dispensary, officers' quarters, laundry, and all buildings connected with the station are supplied with modern sanitary plumbing, with automatic flush-tank closets, and suitable lavatories, etc. The tide is at times so swift that it is difficult to board a vessel in a small row-boat, but a naphtha launch has been ordered and is now in transit; it is a necessity, and will be a great convenience to the station.

It is estimated that it will require \$23,000 to complete the station, including accommodations or barracks for cabin passengers, and it is hoped that this may be soon accomplished. For some reason not easily understood, the War Department refuses to give any more land to the station; this land is needed for the barracks back of and adjacent to the station. The War Department owns about 1,100 acres of land on the west side of the bay, including this territory about and including Point Loma. The small plot required for this important service would not apparently be missed from the domain of the War Department. It is a matter of great moment, not alone to California, but to the entire coast and interior as well, and no influence should be withheld that would in any way contribute to the early completion of this most important station. Being located in this natural harbor, and near the Mexican border, and being the gateway for all infectious diseases, as smallpox, yellow fever, typhus, cholera, etc., it is of vital interest to the California State Board of Health; and when this station is completed we should feel that the State of California is secure at the south gate.

The buildings and grounds, and every department of the station, are neatness itself. The station is in charge of Dr. W. W. McKay, an accomplished sanitarian and efficient officer, with his estimable wife and son and four men to complete the personnel of the staff on duty at present. We were afforded every opportunity for most thorough inspection, and kindly supplied with all necessary information relative to the details of the work of boarding vessels and their subsequent inspection.

In order to get additional information, we addressed a letter of inquiry to Surgeon McKay, and received the following in reply, which we submit

as a part of this report, and ask that it be published also in the Transactions of the California State Board of Health.

Respectfully submitted.

J. H. DAVISSON, M.D.
C. A. RUGGLES, M.D.

MARINE HOSPITAL SERVICE, DISTRICT OF THE PACIFIC,
SURGEON'S OFFICE NATIONAL QUARANTINE STATION,
PORT OF SAN DIEGO, CAL., March 22, 1894. }

J. H. DAVISSON, M.D., *Los Angeles, Cal.:*

DEAR DOCTOR: I am just in receipt of yours of the 21st inst., relative to any additional improvements that may have been made here since your visit in January last.

Since that time the station has been supplied with a 35-foot 10 horse-power naphtha launch for the purpose of boarding vessels and carrying supplies to the station; this, of course, is quite an addition to the equipment of the station. I am informed that the plans for fumigating machinery are all ready, but there is not sufficient appropriation at present available for its construction.

An inspection service is maintained here throughout the entire year, on account of the Mexican and lower coast steamers. All the rules and regulations made by the Secretary of the Treasury under the Act of Congress approved February 15, 1893, are strictly complied with.

The total number of sail and steam vessels arriving from October 1, 1893, to October 1, 1894, was 313; total tonnage, 263,109; of this number 180 were from foreign ports.

Any further information you may desire will be gladly supplied. Hoping to see you soon again, I am,

Very respectfully yours,

DR. W. W. MCKAY, M. H. S.,
In charge San Diego Quarantine Station.

SCHOOL HYGIENE FOR PUBLIC SCHOOL TEACHERS.

[Circular No. 5 of the Preventive Disease Series of the State Board of Health.]

This circular is published by authority of the State Board of Health to furnish a short and concise code of instruction to school teachers, so as to aid them in the preservation of the health of their pupils.

Such rules are quite generally understood and observed by careful and experienced teachers, but the lessons of personal and school hygiene must be constantly repeated, that they may become deeply ingrained in the mind as a part of the law of self-preservation.

The single fact that twelve or more years of the life of the individual are frequently spent in the schools is sufficient to demonstrate the importance of the subject.

This circular is devoted to the care of school grounds, the water supply, the water-closets, urinals, or privies, the school-room, the floor, the light, ventilation, warming, wet clothes, hours of study, cigarette smoking, exercise, attention to calls of nature, and contagious diseases.

CARE OF SCHOOL GROUNDS.

This comprises the care of the basement, the school yard, the well or other water supply, and the water-closets, urinals, or privies.

School grounds should be high enough so that water cannot collect in puddles, and should have a wooden grated walk from the back door of the school-house to the water-closet or privy, which should not be situated too far away. Under no circumstances should a water-closet or urinal be tolerated in a school basement. The basement should be kept scrupulously clean, and be whitewashed once a year. It is better to have the floor bituminized. Give pupils no chance or opportunity to commit a nuisance in the basement. It is often better to exclude pupils therefrom altogether.

WELLS, OR OTHER WATER SUPPLY.

If water from wells be used, see that the well is 200 or more feet from the nearest privy. Insist that it shall be cleansed at the beginning of every school term.

WATER-CLOSETS, URINALS, OR PRIVIES.

These should be set well apart for the sexes, and a high and tight fence should run back to the rear of the school yard. But the privies should not be close to this dividing line. Water-closet floors should be bituminized or cemented, and urinals should be vitrified. Privies should be cleansed as often as they become offensive.

Principals or teachers should know from personal inspection the condition of the water-closets and privies, and should promptly report to the

janitor, the School Trustees, or the Superintendent, any cause of offense to sight or smell. If no attention is paid to your notification by the janitor, notify the Trustees in writing, or appeal in the same manner to the Superintendent, and do not give up until the nuisance is abated by cleansing and disinfection. You have a last resort. Appeal by note or card to the Health Officer. Remember that you will have the moral support of all reputable physicians, and that your influence in the community will increase with the care you take of the health of the little ones in your charge.

SCHOOL-ROOM.

The school-room should be kept free from dust and scrupulously clean. The walls should be white or of a light tint, and should be kalsomined twice a year. The sun should shine in the room at least once a day, but do not let it shine on the pupils or on the printed pages they are studying. Have the pupils face a wall with no windows. There should be an abundance of light.

The doors of all school-rooms should be hung so as to open outwardly, to facilitate escape in case of fire or other danger.

Ventilation is very important, but pupils must not be caused to sit in a draft. Many schools can be ventilated by doors and windows only, and in warm weather they may all be left open, but in cold or wet or damp and raw weather, only the windows on the side opposite that from which the wind blows should be let down from the top for ventilation. Always have a reliable thermometer in the room, which should be kept near a temperature of 70° Fahr.

The floor of the room should be perfectly tight. No wind must be allowed to whistle through the cracks. If the floors are not perfect the cracks should be filled with wax or paraffine, for no draft is more dangerous and uncomfortable than that which comes up through a defective floor.

If there is an artificial means for ventilating the room, less care will be needed; but if there are no ventilating shafts, have the windows let down from the top. Do not raise them from the bottom.

RESULTS OF BREATHING THE AIR OF AN UNVENTILATED SCHOOL-ROOM.

Listlessness, headache, lassitude, and indigestion may all be produced by want of ventilation in the school-room, and may aid or result in severe and dangerous sickness.

The brain and mind to be active need pure air in the lungs. Teachers may also, unconsciously perhaps, become petulant, impatient, and fidgety from breathing a close atmosphere in an unventilated school-room. Remember that the young are much more susceptible to such influences than adults.

DRINKING WATER.

Let the young children have water as often as they want it. They need it very often. Place no restriction on them in that respect.

NECESSARY FURNITURE.

In addition to the necessary furniture of a well-appointed school-room, there should be a mirror and a vitrified iron wash-bowl; if there is a hydrant in the vestibule or hall, the latter may be dispensed with. But on no account should there be soap or towel. A class is composed of children from many homes in different conditions of life, and some may have on their hands and faces the germs of contagious diseases. Thus, from using one towel in common, sore eyes, itch, and ringworm may be easily spread, while the more severe contagious diseases may also be communicated by the same means. Let each pupil furnish his own soap and towel. It would be better if each furnished his own drinking cup.

WET CLOTHES.

If a pupil comes in with wet clothes, time must be allowed near the stove or heater to dry them before being permitted to take a seat, and no study should be imposed while in the process of drying.

SCHOOL HOURS.

In California the minimum school age is 6 years. From that age to 8 years the pupils should not be kept in school more than two or two and a half hours. From 8 to 10 years, 3 to 4 hours; from 10 to 12 years, 4 to 5 hours; from 12 to 15 years, 5 to 6 hours; from 15 to 18 years, 6 to 7 hours.

The time consumed during recesses and intermissions is included in these hours, as must also be the time consumed in attending to the bodily functions.

These hours are a little in excess of those usually recommended, but they may be modified to meet the requirements of any school. It is not to be expected that all of what are called "hours of study," which are here called "school hours," shall be devoted to study. To attempt it is to insure injury to health. Let all the pupils in the room at intervals rise and stand in the aisles. It will be still better if they are caused to sing one or two stanzas of a cheerful song. That relieves the mind, fills the lungs, corrects the stoop, rests cramped muscles and joints, and leaves the pupils freshened to resume work.

If the School Board authorizes calisthenics or other physical exercise, let it be gone through with quickness and energy, and then stop. Do not prolong the exercise nor perform it in a slow or dragging manner.

CIGARETTE SMOKING.

To be an habitual smoker of manufactured cigarettes is to be an opium smoker, and an habitual opium smoker cannot be the equal of an abstainer, when everything else is equal. Under no circumstances should a pupil be allowed to smoke them either at school, on the way to or from school, or at home, if the teacher, by admonition, advice, precept, example, or by any influence, can prevent it. Always inform the parents and Principal, or Superintendent, at once when a discovery is made. Use authority and entreaty, for of all seemingly innocent experiments, this is one that most surely leads to moral and physical degradation with

unerring certainty. Neither the liquor nor the tobacco habit can be compared with it. *Nearly all manufactured cigarettes contain opium.* It is this baleful drug that fixes the habit on its victim.

CALLS OF NATURE.

Some teachers seem reluctant to let pupils go out frequently to the closet and urinal. This is a serious mistake. Let them go often. Nervous and delicate children must go out frequently, or they may wet and soil their clothes. Others can contain themselves, but cannot study while doing so. Others suffer from headache and nervous disorders as a result, and are often allowed to stay away from school altogether because they are not permitted to go out as often as nature demands. Very young children should be allowed to go out as often as they desire. It is better to err in favor of the children.

CONTAGIOUS DISEASES.

All children should bear evidence of a successful vaccination when admitted to school.

Any pupil found suffering from a suspicious sore throat or diphtheria, scarlet fever, smallpox, chickenpox, measles, whooping-cough, itch, ringworm, or disease of the eyes, must be excluded until they bring a certificate from a reputable physician that it is safe to let them mingle with other children.

Report all cases of diphtheria and eruptive diseases at once to the Health Officer by letter or card, giving name and number of street.

Where a case of contagious disease exists, all the children of the family should be excluded from school as long as there is danger of communicating the disease.

Never send a pupil to the residence of an absent one to inquire the reason of absence. Perhaps the absence is due to some acute contagious or infectious disease, and the innocent messenger may contract it in that way. It is better to write a note or send the truant officer to inquire.

RECAPITULATION IN BRIEF.

The school grounds must be high and dry.

The basement must be kept clean and thoroughly ventilated.

The well should not be less than 200 feet from a privy, and cleaned out twice a year.

The water-closets, and urinals, or privies, should be inspected daily by the Principal or teacher.

Have all outside doors open outwardly.

Let no blackboards be placed between windows.

Have the pupils face a wall with no windows.

Have perfectly tight floors.

Ventilate well, but do not let the room become uncomfortably cold nor permit pupils to sit in a draft.

Do not let a pupil take a seat in wet clothes.

Let young children have water as often as they want it.

Go through all exercises promptly, quickly, and with energetic precision.

Have a mirror and a vitrified iron wash-bowl in the school-room, but no soap nor towel.

Allow no cigarette or other smoking, and give no opportunity for any kind of vice or nuisance about the school premises.

Let pupils go to the water-closet, privy, or urinal as often as necessary. Let them go too often rather than not often enough.

See that all pupils have been vaccinated.

Report all cases of contagious diseases at once to the Health Officer by mail.

Do not permit them to return until they bring a certificate from a reputable physician that they are no longer dangerous to others.

Send no pupil to the residence of another to inquire the cause of absence. Write, or send the truant officer.

Most of the above rules apply to both city and country schools. In country schools there are no health officers, truant officers, nor janitors, and the teacher must often exercise personal discretion, and be guided by the circumstances of the case. Even in city schools it is well not to trust too much to janitors. It is better for the Principal or teacher to personally inspect the premises and early form a habit of close observation of the sanitary delinquencies and necessities of any school. Be fearless and prompt in demanding what is necessary, and do not be poohpoohed out of your firm convictions.

Firmness and courage go with a knowledge of what is right. Whenever you are in doubt call on the Health Officer or Board of Health, or any physician, and you may rest assured that the medical profession and all intelligent people will sustain and back you in your endeavors to preserve the health of the innocent ones committed to your care.

TUBERCULIN TESTS.

To the Secretary of the State Board of Health:

For the purpose of determining the efficacy of tuberculin in the diagnosis of tuberculosis in dairy cattle, Dr. Ruggles, President of the State Board of Health, enlisted the services of Dr. C. B. Orvis, County Veterinarian of San Joaquin County. They gained permission, on May 21, 1894, from the Directors of the Stockton Insane Asylum, to apply the tuberculin test to the dairy herd connected with the asylum. Eleven animals were separated from the herd, which numbered about fifty head, and submitted to the test. All injections were made on the 21st day of May, at 10 p. m. The following is the result of the test:

No. 1. Cow, 2 years old. 25 minims of tuberculin injected.

Temperature before Injection.	Temperature after Injection.
May 21, 1894—11 A. M. 101.2°	May 22, 1894— 6 A. M. 103.4°
3 P. M. 101.4°	8 A. M. 104.0°
7 P. M. 101.0°	10 A. M. 105.3°
10 P. M. 102.0	12 M. 104.2°
	3 P. M. 104.2°

Reaction, 3.3°.

No. 2. Spotted cow. Tympanitic occasionally. 30 minims injected.

Temperature before Injection.	Temperature after Injection.
May 21, 1894—11 A. M. 101.2°	May 22, 1894— 6 A. M. 102.4°
3 P. M. 101.4°	8 A. M. 105.0°
7 P. M. 102.1°	10 A. M. 107.0°
10 P. M. 102.0°	12 M. 107.0°
	6 P. M. 107.0°

Reaction, 5.8°.

No. 3. Spotted cow. Curdled milk. 30 mm. injected.

Temperature before Injection.	Temperature after Injection.
May 21, 1894—11 A. M. 101.0°	May 22, 1894— 6 A. M. 100.3°
3 P. M. 101.1°	8 A. M. 102.0°
7 P. M. 101.2°	10 A. M. 104.0°
10 P. M. 101.4°	12 M. 106.0°
	3 P. M. 106.2°
	6 P. M. 105.3°

Reaction, 4.3°.

No. 4. Cow. Persistent œstrum. 30 mm. injected.

Temperature before Injection.	Temperature after Injection.
May 21, 1894—11 A. M. 100.3°	May 22, 1894— 6 A. M. 101.1°
3 P. M. 100.4°	8 A. M. 101.0°
7 P. M. 101.2°	10 A. M. 101.0°
10 P. M. 100.4°	12 M. 101.0°
	3 P. M. 100.4°

Reaction, none.

No. 5. Cow. Thoroughbred Holstein. 30 mm. injected.

Temperature before Injection.	Temperature after Injection.
May 21, 1894—11 A. M. 100.3°	May 22, 1894— 6 A. M. 102.0°
3 P. M. 101.0°	8 A. M. 104.0°
7 P. M. 101.0°	10 A. M. 105.0°
10 P. M. 101.0°	12 M. 106.2°
	3 P. M. 106.0°

Reaction, 5.2°.

No. 6. Cow. Thoroughbred Holstein. 30 mm. injected.

Temperature before Injection.	Temperature after Injection.
May 21, 1894—11 A. M. 100.3°	May 22, 1894— 6 A. M. 101.0°
3 P. M. 101.1°	8 A. M. 100.1°
7 P. M. 101.3°	10 A. M. 100.0°
10 P. M. 101.2°	12 M. 101.0°
	3 P. M. 101.0°

Reaction, none.

No. 7. Cow. 30 mm. injected.

Temperature before Injection.	Temperature after Injection.
May 21, 1894—11 A. M. 100.2°	May 22, 1894— 6 A. M. 100.2°
3 P. M. 100.2°	8 A. M. 100.2°
7 P. M. 100.3°	10 A. M. 102.2°
10 P. M. 100.1°	12 M. 103.0°
	3 P. M. 105.0°
	6 P. M. 104.0°

Reaction, 4.2°.

No. 8. Cow. Coughs very often. 30 mm. injected.

Temperature before Injection.	Temperature after Injection.
May 21, 1894—11 A. M. 102.2°	May 22, 1894— 6 A. M. 103.0°
3 P. M. 103.0°	8 A. M. 103.3°
7 P. M. 103.1°	10 A. M. 105.2°
10 P. M. 102.0°	12 M. 107.0°
	3 P. M. 105.0°

Reaction, 3.4°.

No. 9. Bull. Weight, 1,900 lbs. Holstein. 45 mm. injected.

Temperature before Injection.	Temperature after Injection.
May 21, 1894—11 A. M. 101.2°	May 22, 1894—6 A. M. 100.1°
3 P. M. 101.1°	8 A. M. 100.2°
7 P. M. 101.3°	10 A. M. 100.2°
10 P. M. 101.0°	12 M. 100.0°
	3 P. M. 100.0°

Reaction, none.

No. 10. Bull. Weight, 2,240 lbs. Holstein. 45 mm. injected.

Temperature before Injection.	Temperature after Injection.
May 21, 1894—11 A. M. 101.0°	May 22, 1894—6 A. M. 100.0°
3 P. M. 101.0°	8 A. M. 100.2°
7 P. M. 101.1°	10 A. M. 102.2°
10 P. M. 100.4°	12 M. 104.4°
	3 P. M. 105.0°
	6 P. M. 104.1°

Reaction, 3.2°.

No. 11. Bull. Aged Jersey. 30 mm. injected.

Temperature before Injection.	Temperature after Injection.
May 21, 1894—11 A. M. 101.2°	May 22, 1894—6 A. M. 101.2°
3 P. M. 101.0°	8 A. M. 102.2°
7 P. M. 101.0°	10 A. M. 104.2°
10 P. M. 101.0°	12 M. 105.0°
	3 P. M. 104.4°
	6 P. M. 105.0°

Reaction, 3.3°.

The above tables show that eight out of the eleven head gave a reaction of over 2° Fah., showing that eight out of the eleven head were suffering from tuberculosis.

On May 26th it was decided to hold autopsies on the animals that showed the reaction under the tuberculin test. The autopsies were conducted by Dr. Ruggles and Dr. Orvis, assisted by Drs. Spencer, Maclay, Eddy, and Archibald (veterinarians).

Owing to some misunderstanding only two animals were destroyed, and these two had showed the least reaction under the test.

The following is the result of the post mortems:

No. 7. Cow, five years old; weight, about 1,200 pounds. At the hour of injection, the temperature of this animal was 100.2°; in seventeen hours afterwards, it was 105°. *Post Mortem Appearances:* Slight infiltration at the seat of inoculation. Tumor on the upper third of the neck, adherent to the trachea, was removed, and on cross-section presented an unmistakable tubercular appearance—yellow tubercle softened. Pharyngeal glands tuberculous and undergoing retrogressive changes. Tubercle, in various stages, found on the pulmonary, costal, and diaphragmatic pleura, more especially on the left side. Lungs slightly affected, a few noduli being present in the substance of both

lungs. Mediastinal glands also tubercular and undergoing retrogressive changes. Mammary gland slightly infiltrated with a serous fluid, otherwise negative. Liver, negative. Kidneys, negative.

No. 2. Cow, six years old; weight, about 1,400 pounds; calf in utero 7 months. At the hour of injection, the temperature of this animal was 102°; in seventeen hours afterwards, it was 107°. *Post Mortem Appearances:* Infiltration at the seat of inoculation more pronounced than in case No. 7. Pharyngeal glands, tuberculous nodules very numerous, and undergoing retrogressive changes. Two large growths were found adherent to the anterior (superior in man) portion of the diaphragm, which on section presented a striated appearance—somewhat glandular in structure. The main portion of these growths was composed of gray tubercle, softened yellow tubercle being found in the other portions of the tumors. The mediastinal glands were one solid tubercular mass—both gray and yellow. The glands of the abdominal viscera were also highly tubercular. The lungs did not present the appearance of being affected, but on manipulation and section both lungs were found to contain noduli presenting tubercular characteristics. The liver was found to be in an exceedingly bad condition (hepar tuberculosis). Tubercular masses were found in nearly every portion of it, many of which had undergone softening. Mammary gland, kidneys, and ovaries, negative. The uterus was opened and the fœtus removed, but no abnormal conditions were found.

Respectfully,

R. A. ARCHIBALD, D.V.S.

On June 17, 1894, at San José, the following test was made by H. A. Spencer, V.S., at the solicitation of Dr. C. A. Ruggles, President of the State Board of Health:

The animal was a high-grade Jersey cow; age, six years; weight, 1,000 pounds. Hour of injection, 10:30 P. M.; amount injected, 30 minims.

Temperature before Injection.		Temperature after Injection.	
June 17, 1894—	8:30 A. M. 100 $\frac{3}{4}$ °	June 18, 1894—	6 A. M. 100 $\frac{1}{2}$ °
	9:30 A. M. 100 $\frac{1}{2}$ °		7 A. M. 101 $\frac{1}{2}$ °
	10:30 A. M. 101 $\frac{1}{2}$ °		8 A. M. 102 $\frac{1}{2}$ °
	11:30 A. M. 101 $\frac{1}{2}$ °		9 A. M. 104 $\frac{1}{2}$ °
	12:30 P. M. 101 $\frac{1}{2}$ °		10 A. M. 106 $\frac{1}{2}$ °
	1:30 P. M. 102 $\frac{1}{2}$ °		11 A. M. 106 $\frac{1}{2}$ °
	2:30 P. M. 102 $\frac{1}{2}$ °		12 M. 106 $\frac{1}{2}$ °
	4:30 P. M. 103 $\frac{1}{2}$ °		1 P. M. 106 $\frac{1}{2}$ °
	5:30 P. M. 104 $\frac{1}{2}$ °		2 P. M. 106 $\frac{1}{2}$ °
	6:30 P. M. 104 $\frac{1}{2}$ °		3 P. M. 106 $\frac{1}{2}$ °
	7:30 P. M. 104 $\frac{1}{2}$ °		4 P. M. 106 $\frac{1}{2}$ °
	8:30 P. M. 102 $\frac{1}{2}$ °		5 P. M. 106 $\frac{1}{2}$ °
	9:30 P. M. 101 $\frac{1}{2}$ °		6 P. M. 107 $\frac{1}{2}$ °
	10:30 P. M. 101 $\frac{1}{2}$ °		7 P. M. 107 $\frac{1}{2}$ °
			8 P. M. 107 $\frac{1}{2}$ °
			9 P. M. 106 $\frac{1}{2}$ °
			10 P. M. 106 $\frac{1}{2}$ °

Ante-mortem condition: Fair flesh; gave two gallons milk morning and night; breathing distressed from laryngeal trouble; parotids considerably swollen, evidently of long standing; quite perceptible grating of pleura lower right side; coughs occasionally; peculiar regurgitation

in the œsophagus. (Must be due to the laryngeal or pharyngeal swellings.) Temperature taken for nine consecutive hours on the day previous (June 16th), ranged as follows, commencing at 9:45 A. M. and continuing till 5:45 P. M.: 102.1°, 101.3°, 101.4°, 101.3°, 101.4°, 101.4°, 102.3°, 103°, 102.4°. The variation in temperature determined me to try one more day, with result as tabulated. At 10:30 P. M., June 17th, injected 30 minims tuberculin. Cow milked and fed hay regularly at 7 A. M., 12 M., and 6 P. M.; water *ad libitum*.

Destroyed at 2:30 P. M., June 19th. Autopsy: Thyroid gland weighed nearly 7 pounds and full of tubercular pus; sublingual glands show deposits of caseous matter; mediastinal gland miliary tubercled and caseous material; right lung one immense tubercular tumor and numerous small ones; left lung presented the same characteristics; spleen showed a recent rupture, partially cicatrized; one ovary a complete tubercular deposit in its entirety; left front quarter of udder and inguinal gland involved.

SACRAMENTO, June 19, 1894.

J. R. LAINE, M.D., *Secretary State Board of Health*:

DEAR SIR: On the 2d instant, at the request of your honorable body, I commenced the examination (microscopical) of some specimens of lung tissue handed to me by R. A. Archibald, V.S. Said specimens were immersed in alcohol (dilute).

I have to report as follows: The tissues not being sufficiently hardened to admit of the use of the microtome, they were placed in absolute alcohol for four days. Sections of same were then planted in pure paraffin, and other sections in a mixture of 1 part gelatine, 2 parts water, and 4 parts glycerine, previously cooked and allowed to cool slowly—and again immersed in alcohol. Five sections were then made from these preparations.

The staining process for the microscopic sections was as follows: (1) Immersion in carbol. fuchsin (solution 1) for an hour; (2) then immersing in 10 per cent nitric acid for one half to one minute, to free the non-tubercular tissues of the staining; (3) then washing out the acid by means of 70 per cent alcohol; (4) staining with methylene blue (solution 2); (5) washing with absolute alcohol and immediately afterward with distilled water; (6) immersing in cedar oil, and (7) embedding in Canada balsam.

Twenty-five such sections were prepared and carefully examined under the microscope, $\frac{1}{13}$ objective being used, with eye-piece "C" (Bausch & Lomb), magnifying power 1,160 times. The result of the microscopic examination is affirmative of the presence of tubercule bacilli in large numbers, and I have the honor to so report.

Solution 1 (carbol. fuchsin): 100 g. aq. distil., 5 g. acid carbol. cryst., 10 g. alcohol, 1 g. fuchsin.

Solution 2: 2 gr. methylene blue, 20 gr. absolute alcohol.

Respectfully,

DR. G. C. SIMMONS.

REPORT OF DELEGATE TO PAN-AMERICAN MEDICAL CONGRESS, AT WASHINGTON, D. C.

To his Excellency H. H. MARKHAM, Governor of the State of California:

With a high appreciation of the honor conferred on me by my appointment by you as representative of the State of California to the Pan-American Medical Congress, assembled at Washington, D. C., September 5, 1893, I most respectfully report that while in Boston, Mass., en route to Washington, I saw telegraphic dispatches in the daily papers announcing the existence of Asiatic cholera at Jersey City; that fact having been certainly settled by bacteriological examination of suspected discharges by competent authority at New York City. Knowing full well that previous to my leaving California, although we knew cholera was at the quarantine station in New York harbor, it had been determined by the State Board of Health that if the disease should obtain foothold on the main land, the medical inspection of all passengers by rail into California should immediately go into operation.

Thinking it possible that the Board might act on telegraphic dispatches in newspapers as to the existence of the disease at Jersey City, and on account of possibly unnecessary alarm causing great expense, I deemed it to be my duty to personally investigate the matter; so on Saturday, September 1st, I left Boston, arriving at Jersey City Sunday morning. I immediately sought the office of the Health Department, where I was most agreeably surprised in meeting Surgeon-General Wyman and Dr. Bailache, of the United States Marine Hospital Service, and Dr. Hunt, of New Jersey State Board of Health, whose acquaintance I had previously made. I found national, state, and municipal sanitary authorities all acting as one in perfect harmony, and from these gentlemen I received every kindness and courtesy possible. By invitation I remained at the headquarters of the Sanitary Commission, and every two hours was informed as to the exact condition from reports received from their agents in the field.

I was thus enabled to send a correct account by telegraph to Dr. Laine, Secretary of our State Board. On Monday the reports were more favorable and the aspect more encouraging, and by authority of Surgeon-General Wyman and Dr. Bailache I sent a dispatch to Sacramento that the danger was over. Thus saving, as I believe, the State a great expense for quarantine purposes, which at any other time and under slightly different circumstances might have been perfectly justifiable.

I most cheerfully in this place and in this public manner acknowledge my obligations to the above named gentlemen for their very great kindness to me, and especially to Dr. and Mrs. Bailache, for their hospitality in entertaining me at the United States Marine Hospital on Staten Island.

Having made arrangements with these gentlemen and Dr. Jenkins, quarantine officer at New York City, to keep our Secretary at Sacra-

mento informed by telegraph of any fresh outbreak of the disease, I started for Washington.

The Pan-American Medical Congress, composed of delegates from the United States and all foreign governments on the Western Hemisphere, by special invitation of President Cleveland, was formally opened at 10 o'clock September 5th. Promptly to the minute President Cleveland appeared on the stage, escorted by Right Rev. Wm. Paret, Bishop of Maryland, and Dr. Wm. Pepper, President of the congress. The exercises began with a prayer by the Bishop, when Dr. Pepper introduced President Cleveland, who formally opened the congress with an address of welcome.

It was arranged that for two hours each day the general business of the congress should be transacted, then the remainder of the day was devoted to business of each of the different sections into which the congress was divided. The Section of Hygiene and Quarantine presented the most interest to me. It was most successfully presided over by Medical Director Dr. Gihon, U. S. N., and boasted of a larger attendance than most of the other sections. The personnel of this section was remarkable, being made up of gentlemen of national reputation as sanitarians: Bryce and Montezambert of Canada, Baker of Michigan, Rauch of Illinois, Walcott of Massachusetts, Lindsley of Connecticut, Jenkins and Edson of New York, Lee and Shakespeare of Pennsylvania, and many noted gentlemen from Mexico and South American Governments and the West India Islands—all well and widely known for the deep interest they had taken in sanitary matters. The United States Marine Hospital Service was represented by Surgeon-General Wyman, and the New Orleans Quarantine Station and Louisiana State Board of Health by Dr. Formento.

The time was entirely occupied in the presentation and reading of papers of sanitary character, followed by discussion.

The plans of the United States Marine Hospital Service as to protection of this country from cholera were fully explained and received with much satisfaction. The subjects that presented the principal interest were cholera, typhoid fever, diphtheria, and tuberculosis. The all-absorbing subject for discussion was tuberculosis. While the other named diseases received much attention, this one disease seemed to be paramount in the minds of the section. It was so clearly and so plainly shown that it was communicable, and by what media it was transmissible, that it seemed passing strange that in this enlightened condition of society, this disease was permitted to claim nearly one sixth of all the deaths in the United States. It is simply and solely on account of the people being ignorant on that one very important point: namely, how it is communicable, and how that communicability can be prevented. So fully and distinctly were these facts presented, so forcibly was the necessity of action impressed upon the minds of all present, that as though by inspiration many saw their duty very plainly, on returning each to his own local sphere of usefulness, to begin and teach those unfortunately ignorant on that subject, feeling sure that when the cause and the manner of the transmission of this devastating plague were known and understood, a very great change of improvement must necessarily follow in mortality from that disease.

Among the many subjects read and discussed was one of great importance to many States, particularly to California. I allude to leprosy.

For many years, greatly exaggerated accounts of the contagiousness of this disease have been very prevalent throughout this State, so that mere mention of the word leprosy caused a dread to all. A paper on this subject was read by Dr. Rake, who had had very great experience at the Leper Hospital on the island of Trinidad. He most effectually set aside many of the exaggerated opinions of the contagiousness of this disease, when he stated that in 2,000 cases he twice only was able to trace to direct contagion. His statements had such an effect upon the members of the section that a resolution, asking for governmental precaution against leprosy, introduced by Dr. Lee of the State Board of Health of Pennsylvania, was voted down. While it was conceded that it was communicable by inoculation, even that danger was very much overestimated.

Most respectfully submitted.

C. A. RUGGLES, M.D.

INSPECTION OF HOME FOR FEEBLE-MINDED CHILDREN.

To the State Board of Health:

If there had existed any doubt as to the benefit to the State derived from the annual inspection by the State Board of Health, of the public institutions receiving State aid, it was most effectually dispelled by the visit of inspection to Glen Ellen, the location of the Home for Feeble-Minded Children, made by me June 15, 1894. At a previous visit made by the Board to this institution, a very unfavorable opinion was entertained as to its sanitary condition; much harsh criticism was deservedly indulged in, and severe comments and suggestions were presented as to changes that should be immediately entered into and prosecuted to a finish by those in authority at this institution. There was no difference of opinion among members of the State Board of Health as to the unfortunate condition in which this Home of the Feeble-Minded was found, and the Superintendent, Dr. Osborne, was freely and fully made acquainted with that opinion, and readily agreed with us that something ought to be immediately done, and he assured us that his utmost personal endeavor would be exercised with the Board of Directors in accomplishing the much desired end. And now it affords me much pleasure to say that in his attempt at reformation in that line he has been very successful.

Words will fail to express the difference in condition then and now. It requires actual optical observation to fully realize the change. The first and most important improvement relates to ventilation. The Cottier system has been introduced in the boys' wing of the building, also in the new girls' wing, insuring abundance of fresh and pure air to quarters heretofore sadly deficient in that respect. All rooms and corridors have been wainscoted—a very much needed want for protection of the walls. All walls and ceilings in kitchens and kitchen pantries have been painted in colors very tasteful and pleasing to the eye. Laying concrete floors in the basement and cementing of basement walls will do much to secure dryness to those quarters, and render them more desirable for general use. All floors have been subjected to a process of filling, oiling, and polishing, which makes a very beautiful, cleanly, and pleasant appearance. A large bulkhead, made of concrete, in rear of boys' wing, capped by suitable gas-pipe guard-rail, has been constructed solely by labor of inmates of the institution. It permits a wide and graded area so as to insure ingress of light and air to the basement, and to protect the foundation walls. A general renovation of the departments for idiotic boys and girls has been effected, which, although badly overcrowded, are in much better sanitary condition. I desire to speak of the system of sewerage in operation at this institution in most emphatic terms of approval. I examined it from its inception to its outfall, and found it in my judgment, with its contemplated additional improvements, as perfect and complete a system as can be found in the State. A very rigid and careful inspection was made as to food, clothing, and bedding, with most satisfactory result.

C. A. RUGGLES, M.D.,
Committee.

TESTS FOR IMPURITIES IN DRINKING WATER.

By DR. WINSLOW ANDERSON, of San Francisco.

The following simple tests are issued in order that people who are not practical chemists may have a reliable method of detecting impurities in drinking water.

Water, aside from the usually harmless mineral ingredients which it derives from the earth, is frequently contaminated by excrementitious matter and discharges from industrial establishments. It has been found that rivers flowing through cities, and wells in populous districts, may be contaminated by the germs of cholera, typhoid fever, etc., causing widespread devastation. Sewage or nitrogenous organic matter entering a well or a river disintegrates rapidly, forming ammonia, nitrites and nitrates. Should the sewage be laden with disease-producing germs, such as those of cholera and typhoid fever, the ammonia and albuminoids present in the sewage water act as food for the germs, which multiply rapidly. Such water used for drinking purposes would poison whole communities; hence, the necessity of proper precautions in the water supply.

It is well to remember that water thoroughly boiled is absolutely safe for drinking purposes as far as organic matter and disease-producing germs are concerned, and I would recommend, in the event of an outbreak of cholera or typhoid fever in any city, town, or village, that all drinking water be boiled for half an hour and cooled in covered earthenware vessels before it is consumed.

1. Pure water should be:

(α) Neutral in reaction.

(β) Transparent.

(γ) Colorless.

(δ) Odorless.

(ϵ) And should have no residue on evaporation.

(α) Good drinking water should not give any reaction with acid (red) nor alkaline (blue) litmus paper.

(β) TRANSPARENCY, and (γ) COLOR.

Test: Fill a 6-inch test cylinder with the suspected water, and place it upon a white sheet of paper. Fill a similar glass with distilled water for comparison. Look through the water from the top. Any turbidity or want of transparency in the suspected water should be sufficient cause to have it condemned for drinking purposes, unless it be filtered and boiled.

(δ) ODOR.—Drinking water should be absolutely odorless.

Test: Fill a 500 cc. (about a pint) Florence flask with the water under examination. Heat it gently up to 43.3° C. (110° F.) or 48.6° C. (120° F.). If any odor develops, the water should be condemned, as it will generally be found to contain organic impurities.

(ϵ) RESIDUE (Organic).—Drinking water should never contain any organic matter, as this generally means pollution.

Test: Heat the residue in a platinum dish. If it is dissipated by heat or becomes charred, the water is unfit for use. (See also 2, below.)

(ϵ) RESIDUE (Inorganic).—Pure water contains no residue. Good drinking water, however, generally contains from 6 to 30 parts of solids per 100,000.

Test: Evaporate over a water bath 70 cc. ($2\frac{1}{4}$ oz.) of the suspected water in a previously weighed platinum dish. The weight of the residue represents the total solids in each gallon of water. On dividing this by .7, the number of parts per 100,000 is obtained.

2. DETERMINATION OF ORGANIC MATTER.—As previously stated, drinking water should not contain any organic matter.

Test: To 250 cc. (about 8 oz.) of the water under examination add 5 cc. (75 drops) of dilute sulphuric acid (10 per cent) and enough of the permanganate of potassium solution (.395 grammes to the liter) to tinge the water a rose pink. Apply heat up to 60° C. (140° F.), and allow it to stand for a few minutes. If the pink tinge disappears it is due to the oxidation of the permanganate of potassium, and organic matter is almost certainly present. Such water should be condemned.

3. CHLORIDES.—Chlorine finds its way into drinking water from three sources, viz: (α) sewage (urine) contamination; (β) salt deposits; (γ) seepage from sea water.

Tests: (α) Chlorine may be detected: (1) By its odor; (2) By turning paper dipped in a solution of potassium iodide brown; (3) By bleaching a solution of indigo or litmus.

(β) Chlorides are easily found by throwing down a flocculent white precipitate of silver chloride with the silver nitrate solution. The precipitate is readily soluble in ammonium hydrate, but insoluble in nitric acid.

The amount of chlorides in each gallon of water is estimated by a volumetric solution of nitrate of silver. Drinking water containing chlorides should be boiled, for fear of its being contaminated by sewage.

4. NITRITES AND NITRATES.—Whenever drinking water contains either of these salts, it is almost certain that it is polluted with sewage or organic matter, and should be condemned.

Test: Take 1 cc. (16 drops) of the water to be examined in a test tube. Add to this 2 cc. (32 drops) of dilute (10 per cent) sulphuric acid and 1 drop of pyrogallal (.65 gm. to 30 cc. of water). If nitrites or nitrates are present the water will turn an amethyst or wine color.

Tests—Nitrites: 1. They give red fumes when treated with strong sulphuric acid.

2. They give an instantaneous blue color with potassium iodide and starch paste, on the addition of a few drops of dilute (10 per cent) sulphuric acid.

3. They give a dark brown color with ferrous sulphate.

4. Potassium dichromate in solution is converted into a green liquid by the addition of a nitrite and an acid.

Tests—Nitrates: 1. When heated with sulphuric acid, they evolve pungent fumes of nitric acid.

2. When heated with a solution of ferrous sulphate and a few drops of sulphuric acid a black coloration is produced.

3. Evaporate 4 cc. (60 drops) of the suspected water to dryness and add a few drops of phenyl-sulphuric acid (1 part of carbolic acid, 4 parts of strong sulphuric acid, and 2 parts of water); if nitrates are present a reddish color of nitro-phenal is produced.

5. AMMONIA AND ALBUMINOID SUBSTANCES.

Tests—Ammonia: To 100 cc. ($3\frac{1}{4}$ oz.) of water add 5 cc. (80 drops) of potassium hydrate solution and 1 cc. (16 drops) of sodium carbonate solution to precipitate the earthy salts. Then add 1 cc. (16 drops) of Nessler's reagent. If ammonia is present the water assumes a yellowish tint and should be avoided, as it is contaminated with sewage or organic matter.

(*Nessler's Reagent:* 35 gms. of potassium iodide in 100 cc. water; 17 gms. of mercuric chloride in 300 cc. water; sodium hydrate (20 per cent) 600 cc. to make 1 liter.)

Tests—Albuminoid Substances: In testing for these substances one of the most reliable methods is to use 1 gm. of tannic acid in 3 cc. of water and 1 cc. of alcohol. Of this solution use 10 cc. in 200 cc. of the suspected water. If the water is free from albuminoid contamination, it should remain clear for several hours. If it becomes colored, the water is unfit for use.

6. MINERAL POISONS.—The most important of these are zinc, arsenic, lead, and copper. Drinking water may be poisoned with one or all of these by being kept or stored in leaden pipes or copper or zinc reservoirs. Much water is rich in CO_2 and the alkaline salts (calcium, sodium, etc.), which act on the lead, zinc, or copper, forming soluble salts of these metals. Commercial zinc nearly always contains arsenic, so that great care should be taken in using stored water. In drawing water from the faucets in the morning always let it run for some minutes to clear the pipes of the stagnant and poisonous water, as plumbers will insist on using leaden pipes and joints.

Tests—Zinc: (α) Zinc may be detected by adding a few drops of ammonium sulphide, with like quantities of ammonium chloride and ammonium hydrate to a test-tube half filled with the contaminated water. If present a white precipitate of zinc sulphide is produced, which is insoluble in acetic acid, but freely soluble in dilute hydrochloric acid.

(β) Zinc gives a white gelatinous precipitate of zinc hydrate with potassium hydrate solution.

Tests—Arsenic: (α) Arsenic is readily discovered by acidulating half a test-tube full of water with a few drops of hydrochloric acid, and allowing sulphuretted hydrogen gas to pass into it. Should arsenic be present a yellow precipitate of sulphide of arsenic is produced, which is soluble in ammonium sulphide, but insoluble in hydrochloric acid.

(β) Arsenical water will produce arsenuretted hydrogen gas by boiling it with potassium hydrate and a piece of pure zinc. This gas blackens paper moistened with nitrate of silver.

(γ) Reinsch's test: Arsenical water acidulated with hydrochloric acid

and boiled with a piece of bright copper, will deposit a gray film of arsenic on the copper.

(δ) Marsh's test: Generate hydrogen by the ordinary method of *pure* zinc and dilute sulphuric acid. To this add the arsenical water. Ignite the gas and apply to the flame a porcelain dish, upon which a black metallic mirror of arsenic is deposited.

Tests—Lead: (α) Lead forms a white precipitate of plumbic chloride with hydrochloric acid.

(β) By adding sulphuretted gas, a black precipitate of plumbic sulphide is produced, which is insoluble in ammonium sulphide.

(γ) Lead forms a white precipitate of plumbic sulphate with dilute sulphuric acid.

(δ) Lead gives a yellow precipitate of plumbic iodide with potassium iodide, which is soluble in boiling water.

Tests—Copper: (α) Copper gives a brownish precipitate of sulphide of copper with sulphuretted hydrogen in an acidulated solution.

(β) It forms a pale-blue precipitate with ammonium hydrate, soluble in excess of either.

(γ) In an acid solution, copper gives a chocolate-brown precipitate with potassium ferro-cyanide.

To detect these mineral poisons in water, it often becomes necessary to reduce a gallon or more of the suspected water to one ounce, by boiling, in order to concentrate the mineral salts.

Should water become contaminated by the excreta from cholera or typhoid fever patients, it will respond to the tests for organic matter and to those for nitrites and nitrates and the albuminoid compounds. The microscope will be able to differentiate between the micro-organisms of cholera, typhoid fever, etc.

Mineral water usually contains chlorides, carbonates, sulphates, etc., of sodium, magnesium, calcium, etc., and as such are of considerable therapeutic value; but should ordinary drinking water from rivers, wells, and water systems contain any of the foregoing impurities, it must be looked upon with suspicion, and had better be boiled for half an hour before it is used for drinking purposes.

Boiling will destroy organic impurities and the germs of disease, but it will not destroy the mineral poisons above named; hence, it becomes a matter of importance to have the water tanks and pipes made of iron, and avoid all lead, zinc, and copper contamination.

A STUDY OF WATER IN RELATION TO HEALTH AND DISEASE.

By GEORGE M. KÖNER, M.D., of Fort Bidwell, Modoc County, California.

It is impossible to overestimate the importance of water from a sanitary point of view, for it is not only essential as an article of food, but also for the proper degree of cleanliness of our persons, clothing, dwellings, and surroundings. This fact appears to have been duly appreciated by the settlers in all regions, since homes sprang first into existence wherever nature yielded a bountiful supply of water; indeed, even now we see this well illustrated in the settlement of our own continent. Look where we may, and the land supplied with a spring or traversed by a stream constituted the first choice of our sturdy pioneers. In our towns and cities, the question of water supply has been solved by the introduction of waterworks, but even these vast enterprises are not of modern origin, for in a visit to Rome we will be shown aqueducts which were begun 312 B. C.; these were so large and numerous, that they supplied certainly not less than 300 gallons per head daily for a population of about a million people. Many of these ancient aqueducts have been thoroughly repaired and furnish to modern Rome about 3,000 liters per head. The old Romans were very fond of public and private baths and fountains, as evinced by the baths of Caracalla, the largest mass of ruins in Rome, except the Coliseum; they cover an area of 2,625,000 square yards, and could accommodate one thousand six hundred bathers at one time.

Sources of Water.—The water which we require for our daily use comes to us from the clouds in the form of rain or snow. Of this a certain amount is evaporated; another portion may be collected in cisterns; another soaks into the earth, to reappear in the form of springs; another portion flows off in the direction of surface decline, to join the ponds, streams, or rivers, or it may penetrate the earth sufficiently deep to require us to dig wells for its collection. A high temperature naturally favors rapid evaporation. Some of the water which has percolated into the soil is for the time being absorbed by the roots of vegetation; but in reality there is no loss in nature.

The sources of our water supply may therefore be classified as rain water, surface water (including springs, ponds, streams, rivers), and well water.

1. RAIN WATER.

The mean annual rainfall for different portions of the United States has been tabulated by Dr. Waller, and may be briefly stated as follows:

	Inches.
Northern States east of the Rocky Mountains.....	30 to 50
Southern States.....	50 to 70
Between the Rocky Mountains and the Pacific Coast Range.....	10 to 20
San Francisco.....	20 to 25

Along the North Pacific coast the rainfall increases, amounting to between 70 and 80 inches at Vancouver Island. As we recede from the coast in any country the rainfall diminishes. Fanning gives the average of 40 inches for New England and the Middle States.

One inch of rain would amount, according to Church, to nearly 101 (gross) tons per acre, or on a house-roof of say 20x20 feet area, one inch of rain would be about 250 gallons. With a rainfall of 40 inches per annum, this would amount to 10,000 gallons, or 27 gallons per day.

The average daily supply *per head* in most of our northern cities ranges from 20 to 127 gallons, or more, per day. (Fanning.)

Sources of Impurities in Rain Water.—Rain in its passage to the earth absorbs various impurities from the atmosphere, and these may be augmented from the surface upon which it is received and the receptacles in which it is collected. The impurities in the air are gaseous; the rain water becomes highly aerated, absorbs ammoniac salts, nitric and nitrous acids in small amounts, and, near the sea, chloride of sodium. Air contains on an average about 0.5 gramme of solid matter per 1,000 cubic meters (Rensen), which is equivalent to a little over 0.2 grain per 1,000 cubic feet. The observations of Dr. Miguel at Mont-souris show that the rain washes out of the air immense numbers of bacteria, fungoid organisms, and their spores; their number is always greater in warm weather and in the first shower, or after a prolonged dry season, when as many as 200,000 germs per liter have been found. Parkes tells us that the majority of these organisms are micrococci, and that they, as well as the bacilli and bacteria found in rain, exist to a larger extent in the form of germs or spores than in the adult state. In addition, pollen of grasses, flowers, microscopic plants (*Protococcus pluvialis*), and spores of fungi are found in rain, the latter often in sufficient quantity to cause the so-called "colored rain."

During the prevalence of infectious diseases, there is a possibility that the respective germs may thus contaminate the drinking water. The amount of organic matter varies greatly in different localities, and it is to be hoped that examinations in that direction will be more frequently made in this country. The following table shows the average composition of seventy-three different samples of rain water collected twenty-five miles from London, on a specially prepared surface:

	Parts per 100,000.
Organic carbon	0.099
Organic nitrogen	0.022
Ammonia	0.050
Nitrogen as nitrates and nitrites	0.007
Chlorine	0.63
Hardness	0.62
Total solids on evaporation	3.95

The rain falling in towns contains also more or less sulphurous acid, from combustion of coal, and numerous sooty particles.

It has been truthfully said that rain is a great "purifier of the air," but this also implies that rain water is far from being chemically pure; *i. e.*, a compound of oxygen and hydrogen.

Surfaces for Collection.—The roofs of houses are most commonly used as collecting surfaces for rain water. When we remember the accumulations of dust, soot, vegetable and animal matter (leaves and excre-

ment of birds), the lodgment of minute plants, spores, and germs, perhaps deposits of slops carelessly thrown from the upper windows, we see at once the necessity for rejecting the first portions of the rainfall; for this purpose "cut-offs" have been invented, some of them automatic, by which the first portions of the rain are run to waste, and only the purer after-fall is turned into the storage cistern. The public should be made familiar with these facts. At present, Dr. Smart tells us that these separators are but little used. In this connection, it is well to refer to the material of the roof surface, if the water is to be collected for domestic purposes. Painted or galvanized roofs are liable to contaminate the water with particles of paint or zinc; shingled roofs impart portions of decaying wood, and are, moreover, like tiled roofs, peculiarly prone to collect dust and develop the various fungoid growths. For all these reasons slate roofs should be preferred.

Cisterns.—This brings us naturally to the consideration of the storage receptacles for rain water, commonly called cisterns, and the material of which they are constructed is an important factor as regards the purity of the water supply.

Cisterns or tanks of *wood* are objectionable, as wood, especially when exposed to fluctuations of the water-line, rapidly decays and forms a breeding-place for minute worms and other animal organisms. *Lead linings* are more readily attacked by rain water than any other, and should not be used. This is due to the highly aerated character of rain water, and the presence of nitrates and chlorides; but the solution of lead may be prevented by the presence of sulphates, phosphates, and lime salts (Saunders). It is stated by Parkes that new lead-lined cisterns become rapidly coated with a carbonate or sulphate of lead when the water is hard, or with a carbonate and oxide when it is soft; that these deposits form a lining, which protects the surface of the metal from further action, and should therefore not be scraped when the cistern is being cleaned out. *Cement linings* contain more or less lime, and render the water hard; but the greatest objection is their liability to crack, allowing leakage from the cistern or the seepage of sewage matter into the cistern. *Iron* cisterns rust and discolor the water. *Zinc* is readily attacked and dissolved by water, and produces poisonous effects. *Galvanized iron* has been extensively used, and whilst comparatively safe, it has been known to impart zinc to the water. *Slate* is perhaps the best material for lining, but the cemented joints should not be repaired with red lead when they leak, as the lead oxides are decidedly objectionable. *Stoneware* cisterns, whilst very heavy and cumbersome, are valuable, since they give up nothing to water. These, or cisterns made of slate or galvanized iron, should be preferred.

Location of Cisterns.—If located above ground for domestic uses, they should be placed in a light, well-ventilated, and cool position, to retard decomposition of organic matter, and properly covered.

"The cistern should not be used directly to flush water-closets, but may supply the intercepting or waste-preventing cisterns, which should be used for this purpose. The overflow pipe must be carried out into the open air to terminate as a warning pipe; it may end over the open head of a rain-water pipe, if the cistern is in an upper story, or over a trapped siphon gulley when the cistern is near the ground." (Parkes.)

In the construction of cisterns below the surface, the utmost care must be taken to prevent or arrest contamination of the water from slops, sewage, etc. The English River Pollution Commission found a sample of cistern water "to consist of sewage of even greater strength than average London sewage."

In addition to the danger just referred to, cistern water may be polluted by *other impurities*, such as dead rats, mice, birds, cockroaches, and other small vermin which have gained accidental access, and for all these reasons the cistern should be cleaned at regular intervals.

Dr. Smart, of the United States Army, in his report to the National Board of Health, found the cisterns in New Orleans usually constructed of cypress wood, of an average capacity of about 2,000 gallons, and frequently located "in unventilated inclosures, rank with the emanations of unclean privies."

The average accumulation of sediment, organic and inorganic, in cisterns, is about one inch per annum. An analysis of the air-dried mud from one of these cisterns showed:

	Per Cent.
Moisture	17.2
Organic and volatile	34.0
Mineral matter	48.8

The results of numerous investigations have led to the conclusion that cistern or rain water is never as free from organic contamination as the water from springs and wells, and therefore its use, except for laundry purposes, has been condemned. With the necessary care observed in the collection and storage, it would seem that rain water should prove useful for cooking and washing, on account of its *softness*, which is due to the absence of the salts of lime or magnesia—one grain of chalk wastes about eight grains of soap. The hardness of rain water is generally less than one half degree; that is to say, there is less than one half grain of chalk, or its equivalent salts, to the gallon of water, and is therefore especially valuable in localities where the other water supply is hard. In this connection it is proper to mention that some large cities, like Constantinople, Venice, Malta, and some of our Southern towns, are still either wholly or in part supplied with rain cistern water.

Dr. Smart considers properly constructed underground cisterns preferable, because the cooler situation does not favor the fermentation of the accumulated sediment; moreover, the mineral or earthy matters of which the underground cistern is constructed introduce into the stored water certain bacteria, which transmute ammonia into nitric acid; they are the bacteria of nitrification. The organic matter of the water is first decomposed into ammonia, and this is subsequently transformed into nitric acid. The tendency of cistern water is to improve during its storage, but this does not hold good in wooden tanks, unless the bacteria of nitrification are introduced, as by throwing into the cistern a quantity of clean gravel, to which these bacteria adhere.

The following table, taken from Dr. Waller's article (Parkes' Hygiene, vol. II, p. 406), shows how impure a cistern water may become:

Analyses of Cistern Water.

(Results expressed in parts per 100,000.)

Location.	Total solids	Ammonia	Albimoid Ammonia	Hardness	Chlorine	Analyst.
Podehole	5.28	-----	-----	3.8	0.9	----- River Poll. Comm.
Sheffield Barracks	12.00	0.130	-----	5.8	1.6	----- River Poll. Comm.
Greasely	126.60	0.730	-----	55.70	11.5	----- River Poll. Comm.
Boston, Mass.	5.28	0.013	0.008	-----	0.32	----- W. R. Nichols.
Newport, R. I.	7.50	0.0105	0.0275	3.73	0.76	----- E. Waller.
Omaha, Neb.	6.70	0.012	0.0136	4.03	trace.	----- E. Waller.
Cincinnati, O.	2.68	0.004	0.123	-----	0.55	----- C. H. Stuntz.
Cincinnati, O.	4.48	0.027	0.118	-----	1.97	----- C. H. Stuntz.
Wilmington, N. C.	5.05	0.002	0.015	-----	0.70	----- C. W. Dabney.
Wilmington, N. C.	6.90	0.016	0.008	-----	0.52	----- C. W. Dabney.

Snow Water is considered quite as impure as rain water, and possibly more so. Tissandier, quoted by Dr. Waller, obtained the following results with snow water after it had been melted:

	Solids per 100,000 parts.
Falling in a court in Paris	21.2
Falling on towers of Notre Dame	11.8
Falling in the open country	10.4

About 60 per cent of these solids was mineral matter, and besides these the snow also contained ammonium nitrate. The amount of ammonia, and hence the probable amount of organic matter, has been found to vary with the temperature at which it falls, the nature of the surface on which it falls, and the character of the flakes. (See Vogel, p. 407; Parkes, 2d vol.) In this connection the article of Dr. Charles Smart, U. S. A. (Am. Jour. Med. Sciences, Jan., 1878) is especially interesting. He found the greatest amount of ammonia in the first snows which fell in large heavy flakes at Camp Douglas, Utah, and attributes the origin of mountain fever to the malarious poison contained in such water. Dr. Brewer, of the Army, also speaks of the Western mountaineers attributing this fever to the use of snow water. (Bucks' Hyg., II, pp. 129-134.)

2. SURFACE WATER. (Springs.)

It has already been stated that a considerable portion of the rain soaks into the soil, and after percolating through a mass of rock and soil, undergoing nature's filtering process, it issues forth in the form of springs. In its passage through the soil it absorbs at once carbonic acid from the ground air, which contains two hundred and fifty times more of this gas than the normal atmosphere, and the absorption of this gas adds greatly to the dissolving power of water; hence, the mineral constituents derived from the rocks over which it passes. The quality of the water depends, therefore, largely upon the geological formation through which it passes. In general terms, the older non-calcareous rocks—granite, sandstone—afford the least amount of mineral matters, while the calcareous formations yield the greatest amount. In some springs of great depth, the amount of mineral matter is so large as to render the water unfit for dietetic purposes; some of these mineral springs are also thermal,

indicating that they proceed from a great depth and are probably forced up by the pressure of confined expanding gases. But the springs which interest us most just now are formed in a different manner. The rain which sinks through the porous strata—gravel, chalk, sandstone, etc.—by reason of its gravity, may be arrested at a variable depth by an impermeable stratum of hard rock or clay. Here the water accumulates and forms those underground reservoirs of subsoil water which supply the springs and wells. The water naturally tends to find its own level, and may find this outlet into the sea, or a river, or in springs on a hill side at a much lower level. The springs are therefore formed by the “cropping out,” on the surface of the earth, of such an impermeable stratum, which prevents it from further percolation.

Springs are spoken of as “main” and “land” springs. The former are the deep-seated springs issuing from regular geological formations (such as chalk, oolite, sandstone), and generally yield a constant flow, though subject to seasonal variations. The “land” springs draw their supply from a near and limited collection of underground water in superficial beds of sand and gravel overlying a stratum of clay; they are often intermittent, and frequently go “dry” during the summer months; they are also more liable to contamination than the main springs.

The amount of water yielded by the springs is naturally influenced by the rainfall of the district, and the amount of evaporation; the latter explains the fact that during the winter months from October to March, springs yield a larger supply. The yield of a spring may be readily estimated by ascertaining the length of time required to fill a vessel of measured capacity.

In the discovery of a new spring, it is advisable to determine as far as possible its source, as the following somewhat amusing incident, which occurred here, will indicate: A member of the Hospital Corps surprised the Post Surgeon with the announcement that he had discovered a spring near the brow of the hospital hill. The doctor found a clear, cold spring, yielding a large volume of water. The discovery was announced to the commanding officer, who repaired with his staff to the designated spot, and all regarded the clear, cool spring, in the midst of a California summer, with intense satisfaction. The water was pronounced superior to the water supply of the Post, which was a mountain stream distributed in pipes from an impounding reservoir above the hospital. The commanding officer directed the Quartermaster to take the necessary steps for the protection and utilization of the spring. In the midst of this joy I was informed of the valuable discovery, but having served at the Post for several years, I was incredulous as to its being a natural spring, and suggested the possibility of a “leaky main.” The suggestion was followed up, and led to the discovery of damaged water-closet pipes, a constant flow of water having passed through the closets, and a portion of the drain, by some unaccountable disunion in the latter, found its way into the soil, and being held up by an impermeable stratum, issued forth as a spring about one hundred yards below the hospital. It is needless to say that the spring disappeared after the repair of the pipes.

Composition of Spring Water from different Formations. (Results given in parts per 100,000.)
English River Pollution Commission, Sixth Report; quoted by Waller.

Formation.	Total Solids	Organic Carbon	Organic Nitrogen	Ammonia	Nitrogen as Nitrates, etc.	Chlorine	Hardness	Number of Samples
Granite and gneiss rocks	5.94	0.042	0.008	0.001	0.106	1.69	3.0	8
Silurian rocks	12.33	0.051	0.014	0.001	0.178	1.84	6.8	15
Devonian rocks and old red sandstones	25.06	0.054	0.012	0.001	0.764	3.85	12.0	22
Yoredale and mill stone, grits and coal measures	21.91	0.050	0.014	0.001	0.393	1.85	13.1	22
Lias	36.41	0.073	0.019	0.001	0.467	2.48	30.1	7
Oolites	30.33	0.043	0.011	0.001	0.402	1.55	24.4	35
Chalk	29.84	0.044	0.010	0.001	0.382	2.45	23.6	30
Fluvio-marine, drift, and gravel	61.32	0.086	0.019	0.001	0.354	2.76	37.6	10

Summary.—Springs afford good sources of water supply for general domestic purposes, provided surface pollution is prevented. "Main springs" are preferable, because they are less liable to accidental contaminations, but they generally contain a greater amount of the earthy salts, which give the water the quality of hardness. In other respects, especially in limestone regions, the water is clear, cool, and sparkling. Soap does not form a lather with hard water until the lime and magnesia have been precipitated in the form of curdy salts. If the hardness depends upon the presence of bicarbonates of lime and magnesia, it may be removed by boiling, because heat drives off the carbonic acid, and the less soluble carbonates are precipitated in the form of white flakes; this is called "temporary hardness," in contradistinction of what is called "permanent hardness," which is due to the presence of sulphates, and cannot be removed by boiling.

At one time it was considered of the greatest importance to know exactly how many grains of each particular salt were contained in drinking water, but this is not so essential, for none of the earthy or alkaline salts usually found in water will do harm, unless present in sufficient quantities to constitute mineral waters, which will be detected by the disagreeable taste.

What we do want to know in the matter of spring water is, whether it is free from soakage of the wastes of human life and occupation. It will be readily understood how; in a "land spring" issuing through very porous strata, like gravel, sand, or fissured rocks, the water may have been contaminated by manured fields, barns and stock-yards, cess-pools, and other waste products. This is especially liable to take place if the spring is situated at the base of a hill, on the top of which the polluting influences are going on. In such cases, the dip of the strata will enable us to estimate the probable amount of danger, and a bacteriological examination of the water may also furnish valuable information. Thus Wolfhügel found that in springs which were well protected against the infiltration of impurities, the number of germs contained in 1 cc. was only 182; whilst in springs not so protected, they amounted to 2,730.

3. SURFACE WATER. (Streams, Rivers, Lakes, and Ponds.)

The English River Pollution Commission, 6th Report, estimated that about half of the water descending as rain finds its way into the streams.

In many mountainous districts in the United States and elsewhere, the water which flows off the hillsides is frequently collected by the construction of dams across the cañon through which the stream flows, forming a so-called "impounding reservoir," from which the town or community may be supplied. My personal observations, and those of others, lead me to believe that it is always best to conduct the water in an open ditch to another reservoir before distribution, and to reject the water, unless absolutely necessary, which flows into the "impounding reservoir" during the early spring freshets. There is every reason to believe that apart from the greater amount of earthy matter contained in turbid streams, the amount of organic matter is also largely increased, and may even be a source of water-borne malaria. (See interesting Report of Dr. Smart, *Am. Jour. Med. Sciences*, January, 1878, p. 37.)

Impurities.—The amount of *mineral* matter contained in streams, ponds, and lakes depends not only upon the character and amount contained in their original sources, but also upon the geological character of the country and the erosive power of the streams. The *organic* impurities, as already indicated, are of greater interest to the sanitarian than the mineral constituents. The vegetation in ponds, lakes, and streams, and along their banks, supplies a certain amount of the organic matter, and the winds or rains sweep in more or less, but all this is insignificant when compared with the pollution of animal matter.

The watercourses are the natural drainage channels of a country, and it is not surprising that the wastes of human life and occupation should find their way into the rivers. It is for this reason that the water of streams running through cultivated valleys, with cities, towns, and villages on their banks, contain, often, a dangerous amount of organic matter, and we have the experience of Plymouth, Pennsylvania, to show that the excreta of a single typhoid patient washed into the stream which was used as a water supply, occasioned more than a thousand cases of typhoid fever. To show the contaminating influence of a town on a river, we may say that the River Maine, just above Würzburg, contained only 177 mgr. per liter of organic matter, whilst immediately below the town it contained 470 mgr. per liter.

Hueppe finds that river water contains micro-organisms of every description: infusoria, algæ, fungi, bacteria, and often also metallic poisons. The number of germs varies with the purity of the stream, from 7 to 125,000 per ccm., and even as high as 10,000,000 have been observed. The amount of suspended matter carried by rivers varies at different times and places, but analysis usually reveals an increase as we descend the stream, as shown by the following table, prepared by Dr. Waller. (Parkes' *Hygiene*, vol. II, p. 410.)

Analyses of Waters of Rivers in the United States. (Results in parts per 100,000.)

River.	Place.	Date.	Mineral Matter.	Organic and Volatile.	Total Solids.	Chlorine.	Ammonia.	Albuminoid Ammonia.	Hardness.	Analyst.
Mississippi.	Minneapolis, Minn.	1877	240.1	4.2	18.6	1.1	0.003	0.015	11.47	S. F. Peckham.
Mississippi.	St. Louis, Mo.	Aug., 1873	45.04	2.1	244.3	1.21	0.002	0.068	8.22	D. V. Dean.
Mississippi*.	St. Louis, Mo.	Aug., 1873	45.04	2.1	47.14	0.8	0.011	0.048		D. V. Dean.
Ohio.	Cincinnati, O.	1880			14.2	0.6	trace.			C. H. Stuntz.
Ohio.	Louisville, Ky.	1880			11.7	0.9	0.012			T. C. Van Nuys.
Ohio.	Evansville, Ill.	1880			18.6	0.4	0.003			T. C. Van Nuys.
White.	Indianapolis, Ind.	1880			28.0	0.3	0.000	0.003	7.86	T. C. Van Nuys.
Cumberland.	Nashville, Tenn.	Sept., 1876			13.80	0.4	0.000	0.003		N. T. Lupton.
Cape Fear.	Wilmington, N. C.	Aug., 1881			5.6	0.4	0.008	0.016	6.00	W. R. Nichols.
Hudson.	Albany, N. Y.	Mar., 1872	9.30	1.2	10.5	0.52		0.010		C. F. Chandler.
Hudson.	Poughkeepsie, N. Y.	Nov., 1877	10.40	1.7	12.1			0.010		W. R. Nichols.
Hudson*.	Poughkeepsie, N. Y.	Nov., 1877			10.1			0.010	3.21	W. R. Nichols.
Groton.	New York, N. Y.	1872-1882	5.702	1.078	7.380	0.3	0.001	0.012	8.6	E. Waller.
Schuylkill.	Philadelphia, Pa.	July, 1881			12.01	0.56	0.002	0.002		H. Leffmann.
Passaic.	Falls, N. J.	July, 1872	5.28	2.58	7.86	0.43	0.040	0.040		H. Wurtz.
Passaic.	Belleville, N. J.	July, 1872	7.36	1.95	9.31	0.47	0.049	0.085		H. Wurtz.

* Filtered.

Self-Purification of Rivers.—A study of the above table indicates that rivers near their source always contain a less amount of organic and mineral matters than after they have made a long run and received the drainage from a densely settled region. It is self-evident that a river, after it receives the sewage of a number of towns, cannot be as pure as before, and the question naturally arises, Can a river once polluted with sewage ever be a safe source of supply below the source of pollution? The question of "self-purification of streams" has been earnestly studied, especially in England, and it may be considered as still unsettled. It is, however, conceded that a certain degree of purification is possible by natural means, viz.:

1. Dilution of the sewage with clean or unpolluted water which empties into the stream along its course.

2. By deposition of the suspended matter, carrying with it some of the organic material.

3. By the agency of organisms in the water, as fish, water-plants, algæ, and infusoria, which require organic matter for their food.

4. By the micro-parasites or bacteria of nitrification, which bring about oxidation of organic matter, and then consume it.

5. By the chemical affinity of certain bodies, by which dissolved and noxious substances are rendered insoluble; as, for example, the effect of sulphuretted hydrogen on certain soluble metallic salts.

Of these factors, Uffelmann considers the influence of the micro-organisms in the process of oxidation of the greatest importance, since his experiments clearly show that the mere presence of oxygen in water without the bacteria of nitrification does not lead to a perceptible diminution of organic matter.

The rapidity of oxidation is influenced by the volume of organic matter present, the temperature of the water, the distance of the run, the rapidity of the current, and the character of the river-bed. It is perfectly natural that a rapid mountain stream going over bowlders and rocks should have a better opportunity for aëration than when the current is sluggish.

The various factors named are calculated to purify the water in our streams, provided we give them a chance. This is still true in our own country, but with increasing settlements it is possible that practically here, as in England, the pollution of our streams will almost become continuous from their sources to their mouths. Whilst Dr. Tidy and some other eminent chemists believe that a flow of even ten or twelve miles is sufficient to free a river of all trace of sewage contamination, an outbreak of enteric fever in a hospital using river water was traced to a barracks twenty-five miles up the stream. (Mass. State Board of Health Rep., 1876, p. 284.)

Lake Water.—In many cities a lake constitutes the general water supply, and for the most part a very pure supply is thus obtained, as shown by the following table taken from Dr. Waller's article on water (Parkes' Hygiene, vol. II, p. 410):

Examinations of Water from Lakes and Ponds. (Results given in parts per 100,000.)

Place.	Analyst.	Date.	Organic and Volatile.	Mineral.	Total Solids.	Hardness.
Lake Michigan.....	Chicago, Ill.	1859.....	1.81	9.63	11.44	-----
Lake Erie.....	Cleveland, O.	February, 1866	1.10	8.23	9.33	3.00
Lake Ontario.....	Toronto, Canada.	February, 1878	0.77	11.73	12.50	-----
Lower Chain Lakes.....	Halifax, Nova Scotia.	September, 1878	3.83	3.49	7.32	-----
Lake Massabesic.....	Manchester, N. H.	June, 1869	2.77	1.93	4.70	0.84
South Pond.....	Plymouth, Mass.	June, 1877	1.40	1.60	3.00	-----
Watuppa Pond.....	Fall River, Mass.	1870.....	1.43	1.67	3.10	0.34
Lake Konomoc.....	New London, Conn.	December, 1879	1.20	1.60	2.80	-----
Artificial Lake.....	Norwich, Conn.	January, 1873	1.16	2.00	3.16	0.93
Lake Owasco.....	Auburn, N. Y.	1876.....	1.20	15.80	17.00	8.7
Green Lake.....	Syracuse, N. Y.	January, 1871	1.20	14.14	16.34	-----
Reeds Lake.....	Grand River, Mich.	August, 1872	much.	12.86	-----	-----
Blue Lakes.....	San Francisco, Cal.	April, 1875	-----	-----	21.00	-----

Glasgow is supplied from Loch Katrine, 34 miles from the city. The water contains only $2\frac{1}{2}$ grains of solid matters per gallon, and is regarded very soft and pure. The saving in soap alone since it replaced the polluted River Clyde, in 1859, is estimated at 36,000 pounds sterling per annum.

Finkener's analyses of European lakes indicate that some contain considerable quantities of chlorine, ammonia, and nitrates.

According to Hueppe, the number of micro-organisms contained in 1 cc. of lake water varied from 8 to 1,384.

Summary.—From the evidence, we may conclude that rivers and streams are always purer near their sources, and when not contaminated, they are good sources of supply. After receiving sewage, a stream may, under favorable conditions, undergo a certain degree of self-purification, but we cannot rest satisfied that dangerous contamination does not exist, and such waters cannot be recommended for dietetic purposes, if any better supply can be obtained. The water supply from ponds and lakes, when not stagnant, but undergoing frequent changes, may be regarded as good, provided it has not been contaminated by the sources of impurity already referred to. No surface water, whether from streams, ponds, or lakes, should be used for dietetic purposes until the suspended matter is removed by subsidence or filtration, or both. We shall learn hereafter that the chemical analysis of a drinking water gives no positive information concerning its wholesomeness. The organic matter in a water may be harmless or dangerous. On general principles, we may infer that whenever there is much organic matter there is a greater likelihood of the presence of disease germs.

4. WELL WATER.

It has been estimated that about one fourth of the rainfall of a certain locality soaks into the ground, and may be obtained by sinking wells. There are, practically speaking, but two kinds of wells: "shallow" and "deep," according as they are less or more than fifty feet in depth.

(a) *Shallow wells* are those sunk into superficial, porous beds overlying an impermeable stratum of clay or rock, commonly called "hardpan," and which tap the underground water held up by these formations. They supply the same quality of water yielded by the "land springs" of the respective locality, and are therefore subject to the same contaminations. The rural population, and for that matter many people in towns and cities, derive their water almost exclusively from shallow wells (pump water). Wherever a public supply from unpolluted sources exists, the use of shallow wells should be interdicted, as it is simply impossible to prevent contamination.

The English River Pollution Commission, 6th Report, stated that in their experience shallow wells are almost always polluted by sewage and animal matters of the most disgusting origin. "The common practice in villages, and even in many small towns, is to dispose of the sewage and to provide for the water supply of each cottage or pair of cottages upon the premises. In the little yard or garden attached to each tenement or pair of tenements, two holes are dug in the porous soil; into one of these, usually the shallower of the two, all the filthy

liquids of the house are discharged; from the other, which is sunk below the water-line of the porous stratum, the water for drinking and other domestic purposes is pumped. These two holes are not infrequently within twelve feet of each other, and sometimes even closer. The contents of the filth-hole or cesspool gradually soak away through the surrounding soil and mingle with the water below. As the contents of the water-hole, or well, are pumped out, they are immediately replenished from the surrounding disgusting mixture, and it is not, therefore, very surprising to be assured that such a well does not become dry, even in summer. Unfortunately, excrementitious liquids, especially after they have soaked through a few feet of porous soil, do not impair the palatability of water, and this polluted liquid is consumed from year to year without a suspicion of its character, until the cesspool and well receive infected sewage, and then an outbreak of epidemic disease compels attention to the polluted water. Indeed, our acquaintance with a very large proportion of this class of potable waters has been made, in consequence of the occurrence of severe outbreaks of typhoid fever amongst the persons using them." (English River Pollution Commission, 6th Report.)

What is true of England is under like circumstances true of this country. One reason why our people do not avoid the dangerous proximity of cesspools and wells, is the widespread belief that water becomes purified by filtration through the soil. Whilst this is true to a limited extent, there is abundant evidence to show that organic matter may percolate into wells from quite a distance. Very few persons, in the first place, realize how extensively soil pollution can take place, and fewer still know how far contaminated water may travel before it reaches a well. In some instances, which will be referred to later, the wells were infected from a distance of 30, 60, and even 100 feet. A case is on record in which a well was polluted by gas works-1,000 feet distant. (Fisher, *Dingl. Polyt. Jour.*, ccxi, 139.)

A well usually drains an area all around it in the form of a circle, and this distance, or radius of the circle drained by the well, is generally expressed in terms of the depression. Field and Peggs state that in fine sands and gravels, which offer considerable resistance to the passage of water, the distance varies from 15 to 39 times the depression. In the chalk, where fissures facilitate the passage of water, the distance is 57 times the depression. In very coarse gravel, which allows free passage of water, the distance is from 68 to 160 times the depression; and in the new red sandstone, where extensive fissures exist, the distance is 143 times the depression. These results are founded on experiments made abroad by sinking borings at different distances around the well, but require confirmation by more extended observation. (Parkes.)

The number of micro-parasites in well water varies, according to Hueppe, from 10 to 75,000 per 1 ccm. He found—

In chemically good well water.....	5 to 52 per 1 ccm.
In chemically doubtful well water.....	12 to 8,160 per 1 ccm.
In chemically bad well water.....	0 to 11,960 per 1 ccm.
In wells of densely populated communities.....	0 to 75,000 per 1 ccm.

Waller's table of the results of the analyses of the water of wells, two of them of fair quality and two much polluted, is also presented:

Well Waters.

(Results given in parts per 100,000.)

Appearance.....	Fair.		Polluted.	
	Faintly turbid; colorless.	Clear; light bluish.	Clear; light blue.	Turbid; yellowish.
Odor.....	none.	slight.	sweetish.	foul.
Chlorine in chlorides.....	0.527	0.877	15.114	24.103
Phosphoric acid in phosphates.....	none.	none.	trace.	much.
Nitrogen in nitrates and nitrites.....	0.091	0.252	11.53	4.035
Nitrites.....	none.	none.	trace.	much.
Free ammonia.....	none.	0.0004	0.0072	0.620
Albuminoid ammonia.....	0.004	none.	0.0022	-----
Oxygen absorbed 15 minutes.....	0.0244	none.	0.028	0.265
Oxygen absorbed 3 hours.....	0.0244	0.0054	0.028	0.337
Hardness before boiling.....	1.874	19.23	51.7	32.019
Hardness after boiling.....	1.106	3.72	39.2	30.935
Organic and volatile matter.....	1.60	1.50	44.9	59.40
Mineral matter.....	5.70	22.90	157.10	127.70
Total solids on evaporation.....	7.30	24.40	202.00	187.10

It is very evident that well water contains a larger amount of the chlorides, nitrogen in the form of nitrates and nitrites, also a larger amount of organic matter and germs, than springs and ordinary ground water. The respective amounts are largely influenced by the character of the soil, construction of the wells, and as regards the presence of germs, also by the temperature of the water and the use of the wells. It has been determined that cold water (about 40°), proper protection of the walls of the well, and constant use, furnish the least number of micro-organisms. This would indicate that they gain access, not so much from the ground water, as from the upper strata of the soil, and especially along the walls exposed to the action of the air. The chemical composition of the water would naturally influence the multiplication of germs, as they all require a proper pabulum for their development.

(b) *Drive wells* are made by driving an iron tube with a steel nozzle and perforations at its lower end, for the passage of water into the ground. They are rarely more than 30 feet in depth, and furnish a quality of water similar to that obtained from wells of like depth. They are, however, preferable, because the water is less liable to organic pollution, and if an impervious stratum intervenes between the surface of the soil and the ground water, a very pure quality may be obtained.

(c) *Deep wells* are generally not less than 100 feet in depth, and nowadays are usually made by boring (artesian wells) through regular geological strata. They pass through a superficial porous bed and an underlying impermeable stratum to reach water-bearing strata at greater depths. The water of deep wells usually travels a long distance, and the outcrop of the water-bearing strata on the surface may be many miles from the spot at which the well is sunk; but the position of the strata has an important influence on the quality of the water in relation to filtration from the surface. Dr. Waller has examined the wells of Manhattan Island, varying in depth from a few feet to 1,000 feet or more, and found that none of them "could be regarded as safe for household purposes. The strata on the island stand at angles varying from 80°

to 90° with the horizon, or nearly vertical, and as the tendency of the water is to follow the direction of the strata, a well sunk at one point, however deep, draws its supply from the water which has penetrated the surface not very far off, and in such a densely populated district all the water soaking through the ground becomes practically sewage, and is in the highest degree dangerous for use. London and Paris can sink their artesian wells and obtain wholesome water, since they are situated in geological basins, and the water from these wells has filtered into the water-bearing stratum from considerable distance outside of the city limits; but New York is not so favorably situated." A similar pollution may, of course, occur through rocks containing many fissures, even though they may be nearly horizontal formations. The reports from Rostock and Erlangen show that artesian water at a depth of 300 to 400 feet may be unfit for dietetic purposes. Generally speaking, the water supplied by deep wells is remarkably free from organic impurities; the chlorides, nitrates, nitrites, and CO_2 are present in diminished quantity, but chalk and magnesia are often in excess. The number of micro-organisms in artesian wells, according to Hueppe, is from 15 to 144 per 1 cm., and water from chalk formations is usually free from germs. The temperature of artesian wells varies with their depth. The well at Grenelle is 1,800 feet deep, and yields 656 gallons of water per minute, with a temperature of about 80°.

5. MARSH WATER.

This water is ground and rain water, which stagnates in swampy sub-soil; it always contains a large amount of vegetable matter, sometimes as high as 12 to 40 grains per gallon. The mineral ingredients depend upon the character of the surroundings; calcium and sodium, in combination with carbonic and sulphuric acids, and chlorine, especially in salt marshes, are the most frequent. The water is unfit for drinking purposes, and the brackish water is especially favorable for the development of the germs of malarial fevers.

6. OCEAN WATER.

This water is especially rich in saline matter, the chlorides of sodium, and the chlorides and sulphates of magnesia; it contains very little ammonia, nitrates or nitrites. On account of the chlorides, water from wells near the sea is often quite brackish, although the organic matter may not be very large. At Landguard Fort, water from a boring 150 feet deep yielded more than 500 grains of solids and 380 grains of chlorides; the mean of six other samples was 165 of total solids and 35 of chlorides per gallon.

Summary.—From what has been said on the subject of wells, it is clear that they require special sanitary supervision. The depth of a well has less to do with the purity of the water supply than the prevention of surface and general soil pollution. In locating a well, it is necessary to carefully note: (1) Its position and depth in relation to cess-pools and other sources of pollution, the kitchen drain, barnyard, stables, cemeteries, manufactories, etc. (2) The character of the soil in which the well is sunk in reference to porosity; the lay of the underlying strata.

It would be obviously dangerous, as remarked by Waller, to place a well between a cesspool and the sloping margin of a stream, since the drainage naturally tends toward the stream bed. (3) The distance of a well from possible sources of pollution should be from 100 to 160 times the depression of the water in the well likely to be produced by pumping. All wells should be walled in, closed over, supplied with an iron pump, and protected by a coping to prevent contamination. The clear, sparkling, and palatable character of well water is no indication of its purity, and should not mislead us when the surroundings are suspicious. The River Pollution Commission advised the closing of all the wells in London except three, which were favorably placed; and Fanning considers the danger from contamination in towns where there may be a house every 100 feet very great; but everywhere, even in isolated farm houses, we should feel the necessity of constant attention to the water supply.

THE HYGIENIC IMPORTANCE OF WATER.

We have already referred to the fact that water is of prime necessity to man. It must be remembered that about 75 per cent of the human body consists of water, and the food proper to nourish one should contain about 81.5 per cent of water. "Solid food" contains, roughly speaking, from 50 to 80 per cent of water, and thus to make up the necessary amount of water, and to replace the loss eliminated by the kidneys, lungs, and skin, a certain quantity must be drunk in addition to the food. A healthy man weighing 154 pounds requires every twenty-four hours about $5\frac{1}{2}$ pints of water in some form or other. When the amount of water in the system is diminished by about 1 per cent of the whole, the sensation of thirst is felt, which we usually allay by imbibing the needful amount.

But like all good things, water may be used and abused; it may injure the system if taken in too large quantities, or if too hastily swallowed, or if taken too cold or too hot. If taken too freely, it will dilute the gastric secretions, and thus impair the digestive processes. Hasty drinking, especially if the water is too cold, may produce cardialgia, increased peristaltic action, colic, and, if swallowed when the body is overheated, acute gastric catarrh, and other mischief may result. Luke-warm water is liable to induce nausea, whilst hot water, instead of curing dyspepsia, is more apt to produce that disease, or cause inflammation of the gastric mucous membrane; warm water generally produces a feeling of agreeable warmth.

The degree of *hardness* of the water in relation to health is still a matter of dispute. It has been claimed that the presence of the salts of lime and magnesia may produce in some persons digestive derangements, and even lead to the formation of renal and vesicle calculi; but whilst this is not proven, we know that hard water is objectionable for culinary and washing purposes, and causes a great waste of soap. Very soft water is not free from objections, however, as it readily attacks lead.

Aëration of the water is of importance, since we all know how flat boiled and distilled waters taste. The carbonated waters are especially agreeable, and exert slightly stimulating properties upon the nerves of the digestive tract. Jaworsky, quoted by Uffelmann, claims that they favor the secretion of pepsin.

Ammonia, nitrates and nitrites, which are the oxidized residues of organic matters in the water, unless present in excess are not believed to be injurious to the system. Bartholow, Wood, and Hilgard tell us, however, that the daily introduction of ammonia into the stomach produces more or less irritation of the mucous membrane, and dyspepsia is almost sure to supervene. Circumstances may arise, therefore, to direct our attention to the estimation of ammonia in the water supply; the presence of nitrites is always suspicious.

The presence of *non-oxidized organic matter*, and of micro-parasites in the water, is of great importance to the sanitarian. If this matter is of vegetable origin, it is often quite harmless, unless present in considerable quantity. Organic matters of an animal or excrementitious character are dangerous, as well as disgusting. We have pointed out the various sources of vegetable matter in water, from swamps, forests, vegetation, and dust, and have spoken of the wastes of human life and occupations, cesspools, stables, slaughtering-houses, etc., as the most common sources of animal pollution. We also know that the atmosphere contains bacteria, many of which are the agents of decomposition, and select dead animal and vegetable matter, upon which they feed and proliferate, as their lurking places, and, clinging to such matter, often find their way into surface and other waters. When they are present in moderate numbers, under ordinary circumstances they are not at all harmful to the consumer of water, for the few thousand vegetable cells which we call bacteria may be just as harmless as a few hundred vegetable cells of larger size; but if the water has been derived from an impure source or becomes stagnant, the bacteria may proliferate in such large numbers as to produce serious disorders of the digestive tract. We do not know to what extent the ordinary harmless bacteria may be present before the water would become harmful, but the limit has been placed by Prudden at from 300 to 500 to the teaspoonful.

Now, whilst we know that diarrhœa, cholera morbus, and dysentery have been caused by water containing a large amount of organic matter, and in consequence also a large number of bacteria, it is not yet known whether the organic matter, or the bacteria, or the life products of bacteria, called ptomaines, produce the diseases spoken of, or whether they are invariably caused by the presence of a specific pathogenic germ. It would appear that ptomaines can induce intestinal catarrh, for Brieger has shown that the enteritis of Asiatic cholera is most likely caused by cadaverin and putrescin, and Vaughan regards tyrotoxin, another ptomaine, as the cause of cholera infantum. The presence of these poisonous alkaloids has not yet been demonstrated in ordinary water, but there is much reason for believing that ptomaines are generated whenever the water is charged with decomposable organic matter and bacteria. On the other hand, we do know that certain disease-producing bacteria may be present in the drinking water. In fact, the specific micro-organisms of certain diseases which are often spread through the agency of water have been actually found in water and isolated.

In the first place, Meade, Bolton, and others have shown that the bacilli of typhoid and the coma bacilli may retain their vitality for a certain time in water especially rich in organic matter, and secondly, Koch found his cholera coma bacilli in a pond which supplied Calcutta with water, and they luxuriated particularly well in the suspended particles of organic matter. Mörs, Michael, Beumer, Chantemesse, Vidal,

and others have demonstrated the presence of typhoid bacilli in wells during the prevalence of enteric fever, and in addition to this we have such an array of epidemiological facts connecting the spread of typhoid fever and cholera with a contaminated water supply, that the advocates of the "germ theory" feel fully fortified in their position. Professor Pettenkofer and his adherents, however, reject the "drinking water theory," and maintain that the character of the soil, together with various conditions induced in it by meteorological changes ("telluric theory"), are the principal factors in the production of these diseases. We do not claim that a polluted water supply is the only possible means of spreading the infectious germs of these diseases, but there is sufficient evidence on record that not only the diseases already mentioned, but also diarrhœa, dysentery, malarial and yellow fevers, and diphtheria have been traced to contaminated drinking water.

Goitre appears to be due, in many instances, to the water used for drinking, but as yet we are completely in the dark as to the exact cause. Some attribute it to an excess of the earthy salts; others to compounds of bromine and fluorine. or to a deficiency of iodine; whilst Bircher attributes it to an alga, the navicula.

Entozoa.—There is no doubt that certain parasites, their embryos or eggs, gain access into the system through the water supply. They are: *Tænia solium*, *Bothriocephalus latus* (tape-worms), *Ascaris lumbricoides* (round worms), *Oxyuris vermicularis* (thread worms), *Filaria sanguinis hominis*, the embryos of which are sucked from the blood by mosquitoes, and then transferred to water, *Bilharzia hæmatobia*, *Distoma hepaticum* (liver fluke of sheep), and *Distoma ringeri*, believed to be the cause of endemic hæmoptysis in Eastern Asia, and finally the *Filaria dracunculus*, or guinea worm, which has been known to penetrate the subcutaneous tissues of bathers.

The possibility that parasites and disease germs may also gain access into the system during the washing of vegetables (like lettuce and radishes), fruits, and meats should not be overlooked, and many disease germs may be spread by the wash-water from infected clothing and persons, the cleaning of habitations, and the sprinkling of public highways.

Metallic poisoning may be caused by the waste waters of factories and metalliferous mines gaining access to the water supply, or by the absorption of metals from utensils, water pipes, and tanks. In the case of lead poisoning of Louis Phillips' family at Clairmont, seven tenths of a grain of lead was found in each gallon of water. Similar cases have been reported in France and Germany.

CHARACTERISTICS OF A GOOD WATER.

1. The water should be clear, colorless, and odorless, even when warmed.

2. A temperature between 45° and 60° is the most agreeable for drinking purposes. A lower temperature, such as the pernicious ice pitcher supplies, should be avoided.

3. It should be agreeable to the taste, having a slight pungency from the presence of oxygen or carbonic acid; but the palate cannot be depended upon, as water containing dangerous forms of animal matter is often pleasant enough to the taste.

4. It should be free from suspended matters, infectious germs, and even the suspicion of the presence of such germs.

5. It should be free from metallic contamination, and the degree of hardness should be small for cooking and drinking purposes; the extreme limit is set by some as high as 30 parts per 100,000.

The solids remaining on evaporation, according to Waller, should not exceed 50 parts per 100,000 (about 30 grains per gallon). Less than two parts of organic matter is regarded as admissible, but the quality of the organic impurity is much more important than the quantity.

The presence of phosphates in any marked quantity, unless properly accounted for, is indicative of animal pollution, and strongly suggestive of infectious matter. This is also true of chlorine in chlorides, if not accounted for by natural causes: 5 parts per 100,000 (3 grains per gallon) is the extreme limit assigned by some.

The amounts of ammonia and nitrates should be quite small, while nitrites should be entirely absent, although it does not necessarily follow that they are the products of harmful organic matter.

CLASSIFICATION OF WATERS.

As Regards Quality.—The English River Pollution Commission (6th Report) present the following classification of waters "with respect to wholesomeness, palatability, and general fitness for drinking and cooking."

Wholesome.	{ Spring water.	{ Very palatable.
	{ Deep well water.	
Suspicious.	{ Upland surface water.	{ Moderately palatable.
	{ Stored rain water.	
Dangerous.	{ Surface water from cultivated land.	{ Palatable.
	{ River water to which sewage gains access.	
	{ Shallow well water.	

This classification is quite in accord with clinical facts.

As Regards Quantity.—The water supply must not only be of good quality, but also sufficient in quantity to meet the requirements of cleanliness of our bodies, clothing, homes, streets, and public resorts. Parkes estimates the average daily requirements per head as follows:

	Gallons per head daily.
Household.	{ Fluids as drink..... 0.33
	{ Cooking..... 0.75
	{ Personal ablution..... 5.00
	{ Utensil and house washing..... 3.00
	{ Clothes washing (laundry)..... 3.00
	{ Water-closets..... 5.00
Trade and manufacturing.....	5.00
Municipal.	{ Cleansing streets.....
	{ Public baths and fountains.....
	{ Flushing and cleansing sewers.....
	{ Extinguishing fires.....
Total.....	27.08

A supply of 30 gallons daily per man would appear a sufficient amount for comfort and health. Provision must also be made for live stock, stables, etc. A horse requires about 16 gallons, a cow 10 gallons, and pigs about 5 gallons a day. .

EXAMINATION OF WATER FOR SANITARY PURPOSES.

This may be accomplished by a *physical, microscopical, and biological examination*, and *chemical analysis* of the water. In our present state of knowledge, it is difficult to say which of these tests is of the greatest importance to the sanitarian, and whilst we may conclude that a bacteriological examination of the water will reveal the most important information, it is also true that one examination should supplement the other. As most of the examinations are made by experts, we shall present simply a brief schedule, and refer to the text-books for details.

I. *Taking Samples.*

In taking samples, it is of the utmost importance that it should be received in *perfectly clean* glass vessels; demijohns of 1 to 2 gallons capacity are the best. If the water is taken from a spring, pond, or river, the demijohn should be placed below the surface before it is filled; if the water is too shallow for this purpose, receive it in a smaller vessel and fill the demijohn from the latter. In drawing from pipes, a portion should be allowed to run to waste, in order to obtain an average supply. In towns, samples should be obtained direct from the mains, as well as from the houses. The bottle should be stopped with a glass stopper or a new clean cork, tied in and sealed, and transmitted at once to the analyst, duly labeled as to source of the water, the character of strata, character of the wells and springs, possibilities of impurities, meteorological conditions, droughts, excessive rainfall, prevailing diseases or the existence of any disease supposed to be connected with the water supply, and any remarks tending to show the reason for desiring an analysis.

II. *Physical Examination.*

1. *Color*.—The water should be examined in a two-foot clear white glass tube, standing on a white surface. The best samples are of a bluish or grayish tint; a greenish tint suggests vegetable contamination, whilst light brown or yellow colors are indicative of sewage contamination, but may also be due to peat, or the salts of iron.

2. *Clearness*.—The water in the glass tube or globe should be shaken. The purest waters are clear, bright, and sparkling, but this may also be the case in polluted, shallow well water.

3. *Odor*.—This is best determined by placing the water in a bottle with a narrow neck, and heating it to 104° or 112° F. Hydrogen sulphide, ammonia, and other gases of putrefaction may thus be recognized.

4. *Taste*.—This is an uncertain indication, and is largely influenced by the temperature of the water, and the presence or absence of gases. Iron may be tasted in very small quantities. Polluted or badly tasting waters should be rejected.

5. *Temperature* of the water can readily be determined by means of accurate thermometers placed in the original source, or in water after the amount contained in the house pipe has been allowed to run to waste.

Whilst the physical examination of the water affords no reliable evidence of its purity, it is of importance when no other examination can be made, or in connection with other methods.

III. *Chemical Analysis of Water.*

We have already, on p. 214, referred broadly to the limit at which certain constituents of water may be present without impairing the safety of a drinking water.

A qualitative examination of the solids dissolved in water alone is of no special value in judging the purity of a water, as the same constituents may exist in perfectly pure waters. It is far more important that we should know the amounts of each constituent in order to determine whether they are in excess or not. The chemist employs almost universally the French metric system in quantitative analysis, and the results are usually expressed as parts per 100,000, or as parts per million, which is the same thing as milligrammes per liter. [A liter of water is equal to 1,000 cubic centimeters, and each cubic centimeter of pure water at 4° C. weighs one gramme (= 1,000 milligrammes).] Results are also sometimes expressed as grains per gallon, but this is oftentimes misleading, especially when the report does not specify the gallon used: United States or imperial (English). The latter weighs 70,000 grains, and 70 cc. of water weigh 70,000 milligrammes; the quantity 70 cc. is a miniature gallon, and the results in milligrammes obtained by using 70 cc. may also be expressed as grains per gallon. If grains per gallon are multiplied by 10 and divided by 7, parts per 100,000 are obtained; parts per 100,000 may be converted into grains per gallon by multiplying by 7 and dividing by 10. The metric system should be adopted to the exclusion of all others.

1. *Determination of Total Solids.*—Evaporate 70 cc. of the water to dryness in a weighed platinum or porcelain dish, over a water bath, and weigh the residue thus obtained. This residue may then be heated to redness over a flame; the organic matter and volatile salts are driven off by the heat (note the loss of weight); the residue which remains consists entirely of mineral matters.

2. *Determination of Organic Matter.*—The above test for determining the amount of organic matter is altogether unreliable. Some of the organic matter may be lost on evaporation, or it may not be all driven off by ignition; again many of the mineral constituents may be decomposed with partial loss (carbonate of lime loses its carbonic acid and becomes quicklime); other mineral salts, as potassium chloride, may be partially or totally volatilized. Even the best methods of estimating the amount of organic matters only give approximate results; they are:

(a) *The Permanganate Process.*—Potassium permanganate dissolves readily in water and imparts a strong red-violet tint; it also parts with a large proportion of the oxygen it contains, affording colorless compounds in the presence of an acid. By this process, the oxidizable matters in water are determined in terms of the oxygen required for their oxidation. These matters include oxidizable organic matters, nitrites, ferrous salts, and sulphuretted hydrogen; the latter can be dispelled by heating the water, and the salts of iron may be tasted, but are generally disregarded.

To estimate, therefore, the oxidizable organic matters and nitrites, proceed as follows: Take 250 cc. of the water; add 3 cc. of sulphuric acid; drop in the permanganate solution (capable of yielding, in the

presence of an acid, 0.1 milligramme of oxygen for each cc.) from a burette until a pink color is established; warm the water up to 140° F. (60° C.) and drop in more permanganate solution; if the color disappears when the temperature reaches 140°, remove the lamp and continue the addition of the permanganate until the pink color is permanent for from ten to fifteen minutes. Then read off the number of cc. used; multiply by 0.1, to determine the milligrammes of oxygen required for the oxidation of oxidizable matters, and multiply by 4, to get the amount per liter. Example: 250 cc. of water with 3 cc. of sulphuric acid required 3.5 cc. of permanganate to give permanent color. $3.5 \times 0.1 \times 4 = 1.4$ milligramme of oxygen per liter required for total oxidizable matter, $1.4 \times 0.1 = 0.14$ per 100,000.

If the acidified water, as above given, is boiled for twenty minutes before adding the permanganate solution, the nitrous acid is driven off, and on cooling to 140° F., the oxidizable organic matter in terms of oxygen required for its oxidation may be determined. The nitrous acid in terms of oxygen required for its oxidation may be readily determined by calculation of the difference between the results of the two preceding processes. Each milligramme of oxygen represents 2.875 milligrammes of nitrous acid; we must, therefore, multiply the difference by this factor, and the result is nitrous acid in milligrammes per liter.

The permanganate process is simple and convenient, but is not entitled to implicit faith, for we do not know how much of the organic matter in a given specimen of water is oxidizable by an acid permanganate solution and how much is not. Nitrous acid is considered the first stage in the nitrification of organic matters and ammonia, and suggests, therefore, incomplete oxidation and possible danger.

(b) *The Albuminoid Ammonia Process* was proposed by Wanklyn and others, because of its simplicity: Add to the water remaining in the flask after the distillation of 150 cc. for the estimation of ammonia (free and saline), p. 218, 50 cc. of a strongly alkaline solution of permanganate, and continue the distillation, each 50 cc. of distillate having its ammonia estimated until no more comes over. The ammonia is the result of the action of the caustic permanganate solution at a boiling temperature on the nitrogenous organic matters (albuminous bodies, believed to be the favorable abode of disease germs); hence, this form of ammonia has been called albuminoid ammonia. Urea is not acted on by the solution, but this substance is not found in sewage, unless very fresh, and is never found in sewage-polluted water. All the free or saline ammonia must first be driven off by distillation before testing for "albuminoid ammonia."

(c) *The Organic Carbon and Organic Nitrogen Process* (Franklands). In this process the water is evaporated and the residue burnt with oxide of copper. Nitrogen and carbonic acid gases are set free from the organic matters and their volumes respectively measured and reported as "organic carbon" and "organic nitrogen." The ratio of carbon to nitrogen for animal matter is given as 3.1, and 8.1 for vegetable matter. Good drinking water should not contain over 0.2 part of organic carbon and 0.02 of organic nitrogen per 100,000 of the water. The combustion process requires elaborate apparatus and skilled hands.

In conclusion, the nitrate of silver methods of Leeds and Fleck may be referred to. Of all the tests referred to above, the permanganate process is as reliable as any; none of them are perfect, and none, as Uffel-

mann justly observes, can distinguish the harmless from the dangerous character of organic matter—a fact of great importance in judging the safety of the water.

3. *Determination of Ammonia*.—It is well known that urea, when it undergoes decomposition, is converted into carbonate of ammonia; hence, the ammoniacal odor of sewage. Ammonia will also be found in water polluted with sewage, unless the latter has percolated through a sufficient depth of soil to convert the ammonia by oxidation into nitrates and nitrites. Parkes tells us that a few pure deep-well waters from the chalk and greensand are found to contain excess of ammonia, but are otherwise free from organic matters, whilst sewage-polluted shallow wells not only contain an excess of ammonia, but also an excessive amount of organic matter.

To estimate ammonia, place 500 cc. of the water in a retort connected with a condenser, and distill off about 150 cc. The first 50 cc. contain usually three fourths of the entire amount of saline and free ammonia thus driven off, so that if the quantity of ammonia in the first 50 cc. is estimated, it is only necessary to add a third of this amount to obtain the whole quantity present in half a liter of the water; but the method of estimating the ammonia in each 50 cc. of distillate as it comes over is to be preferred: add 2 cc. of Nessler's solution to each 50 cc. of distillate, and compare on a white surface the yellow coloration produced with that obtained from a measured quantity of the standard ammonium chloride solution, each cc. of which contains 0.01 milligramme of ammonia. If the colors correspond after three to five minutes, read off the number of cc. of ammonium chloride used; allow for the portion of distillate not used; multiply by 0.01, and then by 4; the result is milligrammes of free ammonia per liter, or parts per million; dividing by 10 gives parts per 100,000.

4. *Determination of Nitrates and Nitrites*.—The presence of either or both of these compounds in water is suspicious, since they are the oxidized residues of nitrogenous or organic matter. Nitrates and nitrites are not found in fresh sewage, but are present in combination with lime, soda, potash, etc., in polluted streams and watercourses, and in the effluent subsoil waters from manured or sewaged land. When found in drinking water, they are generally the result of previous pollution either of the water itself or of the soil through which it flows, but we cannot tell when the pollution may have taken place, and for all we know contamination may still be going on. When found in deep wells or springs, their presence simply indicates complete purification of the water in its passage to the deep strata. This is wholly true of the nitrates; but if they are found in shallow wells in connection with nitrites (which represent the transition state between ammonia and albuminoid compounds and the nitrates), and also find an excess of chlorine and ammonia, we may justly regard it as evidence of sewage or animal contamination.

For the purpose of estimating the amount of *nitrates*, evaporate to dryness 10 cc. of the water in a small platinum dish. Add to this residue 3 cc. of a solution of sulphuric acid and phenol and two drops of pure hydrochloric acid, and then warm the dish for three minutes over the water bath. Pour the contents into a Nessler glass, and neutralize with caustic potash solution until effervescence ceases; then fill

up with distilled water to the 50 cc. mark, and compare the depth of the yellow color produced with that of a test solution containing one milligramme of nitrate of potash in each cubic centimeter, to which the same reagents have been added. This process of comparison by depth of coloration is known as "Nesslerizing." To express in terms of nitrogen as nitrates the result must be multiplied by 0.14 (Parkes). The indigo method of Marx Tromsdorff and the Tiemann chloride of iron method are commonly used in Germany.

For the direct determination of *nitrites* a solution of metaphenylenediamine is prepared, and also a dilute sulphuric acid, one part of strong sulphuric acid to two parts of water. One cc. of each solution is added to 100 cc. of the water, which is put in a Nessler glass; a red color is produced. Another glass is placed alongside, and into it is put as much of a standard solution of potassium nitrite as may be necessary, making up the bulk to 100 cc. with distilled water; then add 1 cc. each of the sulphuric acid and the metaphenylenediamine. The remainder of the process is carried on much in the same way as ordinary Nesslerizing. The standard potassium nitrite should be 1 cc. = 0.01 milligramme of NO_2 . The number of cc. used gives the milligrammes of NO_2 present in the sample of water.

5. *Determination of Chlorine*.—As already stated, water in certain localities may contain chlorides in excess. Rain water contains 0.5 per 100,000, and pure waters as high as 1.4 per 100,000. An increase beyond this, unless accounted for by salt-water strata or proximity to the ocean, is strongly indicative of animal pollution, since vegetable contamination may exist without appreciable increase of the chlorides. Sewage derives the chloride of sodium mostly from the urine it contains, and, because of the great solubility of the salt, it is not readily removed by filtration through the strata.

Place 100 cc. of the water to be examined in a white porcelain dish; add 1 cc. of potassium-mono-chromate solution (free from chlorine); drop in the standard silver nitrate from the burette, and stir after each addition; continue to drop until the chlorine, being all precipitated as silver chloride, a reddish color of silver chromate is just obtained. The nitrate of silver solution must be of a strength that 1 cc. will exactly neutralize one milligramme of chlorine. The number of cc. of silver solution used gives the parts of chlorine per 100,000 of water; to express it in grains per English gallon multiply by 0.7.

6. *Determination of Phosphoric Acid in Phosphates*.—The presence of phosphates is generally accepted as an indication of sewage contamination, and their determination furnishes, therefore, strong corroborative evidence. In some cases they may be derived from the rocks through which the water has passed. A qualitative examination usually suffices, but to be more exact proceed as follows:

The incinerated total residue of the solids is to be treated with a few drops of nitric acid, and the silica rendered insoluble by evaporation to dryness. The residue is then taken up with a few drops of dilute nitric acid; some water is added, and the solution is filtered, the filter having been washed with dilute nitric acid; 3 cc. of the filtrate is mixed with 3 cc. of molybdate of ammonia solution, gently warmed and set aside for fifteen minutes at a temperature of 80° . The result is reported

as "traces," "heavy traces," or "very heavy traces." The precipitate may be collected and weighed, after washing with the least quantity of distilled water, and then dissolved to neutrality in dilute ammonia. The solution thus obtained is evaporated with repeated additions of small quantities of water, and the residue is weighed. The weight divided by 28.6 indicates the amount of phosphoric anhydride; to express it in terms of PO_4 divide by 21.4 (Parkes).

7. *Determination of Hardness.*—The hardness of water may be due to salts of lime or magnesia, to volatile (CO_2) or fixed acid. To estimate the total hardness of water, place 70 cc. in a small stoppered bottle, and add the soap solution, shaking it strongly after each addition until a lather is formed which is permanent for five minutes. Then read off the number of cc. of the soap solution used. This solution is made of such a strength that 1 cc. is capable of exactly neutralizing 1 milligramme of carbonate of lime. The number of cc. of soap solution required to form a lather in the 70 cc. of water is the number of milligrammes of carbonate of lime in the 70 cc., or the number of grains per gallon; we should, however, deduct 1 cc., as that amount is required to give a lather in 70 cc. of the purest, even distilled, waters. In Dr. Clark's scale, 1 grain of calcium carbonate or other salts per gallon is called 1 degree of hardness. The permanent or fixed hardness can be determined by the same process with water which has been boiled for half an hour and allowed to cool to 60° , and as the difference between the total and the permanent hardness is the temporary or removable hardness, the result of the permanent hardness should be deducted from the total hardness. The hardness due to magnesian salts can be estimated separately with the soap solution after precipitating all the lime salts with oxalate of ammonia. The amount of permanent hardness is important, as it chiefly depends upon calcium sulphate and chloride and the magnesian salts; it should scarcely exceed 3° or 4° of Clark's scale. It may be due to sewage contamination, as sewage is especially high in permanent hardness.

8. *Determination of Metals.*—The addition of a drop of ammonium sulphide to some of the water in a porcelain dish will produce a dark coloration, even if only slight traces of iron, lead, or copper are present. If it is iron, the addition of a few drops of hydrochloric acid will cause the color to disappear, but the color remains if lead or copper is present. Whilst the presence of iron is of course harmless, water containing lead or copper should be rejected. In order to detect arsenic, large quantities of the water must be distilled and the residue subjected to Marsh's test.

IV. *Microscopical Examination of Water.*

The object of this examination is to determine the presence and character of foreign matter, mineral, animal, or vegetable, found in the sediment or floating in the water, and to see in how far they may be connected with the water pollution from sewage or domestic refuse matter.

Mineral particles are usually recognized by their crystalline or amorphous character.

Vegetable and animal matters, such as fibers of wool, cotton, linen, wood, starch cells, spiral threads of cabbage and other vegetables, macerated paper, human hairs, striped muscular fiber, and squamous

epithelium, suggest the contamination of the water with sewage, possibly with human refuse. The remains of animals of all kinds, such as wings and legs of insects, spiders and their webs, particles of the skin of aquatic animals, are not uncommon. In addition to this we usually find living organisms of a low type, such as bacteria (micrococci, bacilli, and vibrios), amœba, and infusoria. Many of these may be perfectly harmless; others have been recognized as pathogenic, and all suggest the presence of organic matter, on which they feed.

In water polluted with vegetable matters, we find fungi and molds, algæ, diatoms, desmids, and various confervæ. Among decaying vegetable matter will be found an abundance of micro-organisms, including bacteria, amœbæ, different species of englenæ, ciliated, free, and rapidly moving infusoria, such as kolpoda, paramœcia, coleps, stentor, kerona, stylonychia, etc. The presence of the anguillulæ, or water worms, and rotifera, or wheel animalcules, is very common, and while of no special importance, they indicate a supply of organic food and, therefore, impurity of water. Then we have the entomostraca, such as the water flea, daphnia pulex, cyclops quadricornis, and others which occur in many good waters. The amphipoda, isopoda, and tardigrada (water bears) may be met, as well as the larvæ of the water gnat, skip-jack, and the pupa form of many insects may be found in pond water. The presence of entozoa, their embryos and eggs, has already been referred to on page 213. The sewage fungus (*Beggiatoa alba*) is found in waters containing an excess of the sulphates, derived either directly from sewage or from substances used in precipitating sewage or from waste water of manufactories. The fungus forms dense, flocculent, grayish-white masses attached to floating vegetation or to the banks of the stream. The microscope reveals an immense number of colorless threads containing bright, strongly refractive, globular particles of sulphur; the threads branch dichotomously (Parkes).

The foregoing list of microscopical objects is so large as to be confusing in attempts at identification and interpretation; it is well to remember that the lowest forms of organisms, like bacteria, amœbæ, fungi, ova, and ciliated infusoria, are strongly indicative of pollution and putrefactive changes.

Cohn tells us that diatoms, green algæ, and confervæ predominate in water containing a small amount of organic matter, and that they are rarely found in decomposing water; in the latter the infusoria, particularly the ciliated forms, the entomostraca, and wheel animalcules predominate. In waters rich in suspended organic matter, we find principally fungi, infusoria, carnivore, amœbæ, anguillulæ, and some wheel animalcules and tardigrada (water bears). In water containing a large amount of soluble organic matter, we find infusoria, flagellata, certain forms of amœbæ, ciliated infusoria, and bacteria.

Krapelin's studies of the fauna in the Hamburg water system are quite interesting. He found bryozoa, eels, snails, mussels, crabs, mollusks, worms, and all forms of the lowest animal organisms; also two species of marine animals: sea-crabs and platessa flossus. The air-breeding and vegetable-feeding animals were not found, but the aquatic animals supplied with gills, consumers of detritus, and aquatic animals of prey were largely represented. According to this author, the entire fauna in the water system is built up from the lowest forms of animal life, the higher species consuming the lower.

V. *Biological or Bacterioscopic Examination of the Water.*

The principal object of this examination is to determine the presence of pathogenic micro-parasites. The existence of harmless bacteria in water is of secondary importance, and is simply suggestive of danger, but not proof. We can infer from the number of bacteria found that the water is chemically good or bad, and in so far the counting of germs furnishes corroborative evidence of the presence of a larger or smaller amount of organic matter (ammonia, nitrates, or phosphates) in the water, which constitute a suitable pabulum for these organisms).

We have seen, however, that certain pathogenic bacteria have been found in water, and it is quite possible that disease germs do not retain their vitality for any length of time in different qualities of water; it is also possible that they may be destroyed by other bacterial germs. In the bacteriological examination of water presumably contaminated with disease germs, it is therefore of the utmost importance that it shall proceed without delay, and in taking samples it is also desirable to procure them from different depths and place them in sterilized flasks, properly secured. The examination may then proceed as follows: "A measured quantity of the water—1 cc. or a fraction of 1 cc.—is mixed with a test tube full of liquefied, sterilized, nutrient gelatine, a portion of which is then poured on a glass plate and placed under a bell jar, with suitable precautions to prevent the entrance of atmospheric spores. After a few days the germs or spores are found to have developed into recognizable colonies, which may be counted and differentiated by their color, their mode of growth, the liquefaction they produce in the gelatine, and other characteristics. Under the microscope, the colonies may be separated into the different varieties of bacteria, molds, and fungi, and each colony may subsequently be submitted to cultivation in test-tubes of gelatine, agar-agar, blood serum, etc." (Parkes). This last suggestion is especially important. If we find varieties of bacteria which are not common in water, and possibly of a pathogenic character, after obtaining pure cultivations through successive generations, they should be inoculated into animals, to determine whether they are reproduced. For the simple recognition of bacteria it may suffice to put a few drops of the water on a clean glass slide placed on a piece of filtering paper under a bell jar. Let it evaporate, and draw the slide three times in succession through a gas flame; stain with a solution of gentian violet, and examine by means of a high power microscope. The stained bacteria will thus be readily recognized.

PURIFICATION OF WATER.

Sufficient evidence has been adduced to indicate the necessity of freeing the water supply as far as possible from foreign and contaminating ingredients, and this may, to a certain extent at least, be attained by the various methods recommended for the improvement of water.

Boiling.—This is an old remedy for rendering hard water soft. It liberates the carbonic acid, and thus renders the lime and mineral matters, except alkalis, which exist as carbonates, insoluble; the resulting deposit at the bottom also carries with it more or less organic impurity. Another important object of boiling, for at least thirty minutes, is the

destruction of all the minute organisms, and which may include disease germs. Boiled water has lost its pungent, pleasant taste, and should be subjected to the rough aëration, which may be done by shaking, or pouring it back and forth through the air a few times. Hard water may also be softened by Clark's process, which consists in the addition of lime water, causing a precipitate of carbonate of lime. Nine ounces of quicklime will be sufficient for 400 gallons of water, provided the hardness does not exceed 30°. The addition of a little carbonate of soda (washing soda) will accomplish the same purpose.

Distillation effects even a more complete purification of water than boiling. The first portions of the distillate containing generally volatile substances should of course be rejected. Distilled, like boiled, water tastes flat, and should be aërated, as suggested above, or by allowing the water to flow through sprinklers. Distillation of sea water is carried on on all ocean steamers.

Freezing liberates the salts of sea water and destroys a large number of bacteria, but there is sufficient evidence to show that certain disease germs retain their vitality in ice for some time, and that freezing cannot be depended upon for the purification of water polluted with organic matter.

Addition of Chemicals.—The addition of various chemicals to the water, for the purpose of hastening clarification by deposition, has been recommended by various authors. Of these the principal are: alum, perchloride of iron, sodium carbonate, and potassium permanganate. Hager recommends tannin for the destruction of algæ, and Langfeldt extols citric acid for the same purpose. Whilst all these substances cause a precipitate, the same may be accomplished by allowing the water to settle; they have but little effect in purifying a foul water, or in destroying micro-organisms, and as none except the citric acid improve the taste of the water, we possess, in boiling, a far better remedy.

Filtration.—The principal effect of filtration is the removal of the suspended matter in the water. In addition, however, filters, according to the material used, may eliminate some of the dissolved matters; this, of course, depends upon the size of the pores, the pressure, and abstractive qualities of the filter. The principal materials used in the construction of filters are: vegetable and animal charcoal, sand and other porous stones, wool, cotton wool, glass wool, felt, iron sponge, asbestos cloth, porous burned clay.

Charcoal and bone-black, when properly prepared and fresh, certainly have the power of removing all of the suspended matter and a considerable quantity of micro-organisms and dissolved matter, both mineral and organic. According to Knapp, *vegetable charcoal* removes 52.8 per cent of the total solids, 88 per cent of organic matter, and 23.8 per cent of the salts, whilst *animal charcoal*, when fresh, according to Uffelmann, removes 67 per cent of the total solids, 89.2 per cent of organic matter, 24.1 per cent of the salts, and 80 per cent of the micro-parasites. The good effects, however, do not last longer than a few days. The eliminating power for microbes ceases very soon, and it becomes neces-

sary to regenerate it by exposure to heat. If this is not done the filtered water may show more microbes than the original supply.

Sand, especially sharp, angular, white sand grains not exceeding 1.5 mm. in thickness, affords an excellent material for the elimination of suspended impurities. Sand also removes a certain amount of soluble organic matter, and assists in their oxidation. Uffelmann's experiments with a sand filter 1 meter deep show a removal of 38 per cent of oxidizable matter, 4.2 per cent of chlorine, 3.4 per cent of lime, 70 to 80 per cent of micro-parasites; in Hulna's experiments there was a removal of 26.2 per cent of oxidizable matter, 33.6 per cent of ammonia, 50.2 per cent of albuminoid ammonia, 1.6 per cent of chlorine, 9.8 per cent of lime, 20.54 per cent of the total solids.

Sand and gravel are used on a large scale in reservoirs for the purification of water. The water having first been received into settling reservoirs, where the bulky substances subside, is passed over the filter-beds, which consist of, first, layers of fine sand 2 to 3 feet deep, next a 4-inch layer of coarse sand, next below a similar depth of small gravel, next a 6-inch layer of gravel the size of walnuts, and at the bottom a 1½-foot layer of cobblestones the size of apples. In the lower layer are the mouths of the outlet pipes, which convey the water to the pumping stations. Usually the depth of water on filter-beds is scarcely over two feet, and as the upper fine layer of sand catches most of the impurities, it is liable to become choked, and must be frequently removed and washed with the water jetted from a hose under high pressure. By means of such filters, Dr. Frankland tells us that 90 to 99 per cent of micro-organisms are removed from the London waterworks.

Spongy iron, or porous metallic iron, obtained by roasting hematite iron ore, is used for the same purpose in London, Antwerp, and other cities. The fact that iron yields nothing injurious to water, and can be used for a considerable length of time without great deterioration, have been its strongest recommendation, but Pfarre found that the filtrated water is by no means free from micro-organisms, and the iron taste is, moreover, so objectionable that Antwerp subjects its water supply to an additional filtration through sand.

Domestic Filters.—It has been truly said that they are probably more often a source of pollution of the water than otherwise, for the simple reason that no attention is paid to the removal and cleansing of the filtering material; in consequence, its pores become clogged with putrescible organic matter, which favors the multiplication of bacteria, and it is not at all infrequent to find that the filtrate under such circumstances contains more bacteria than the unfiltered water. It should be understood that, in spite of advertisements, there is no such a thing as a "self-cleaning filter," and persons who neglect the cleaning had better do without filters altogether. They should be attended to at least once in ten days, and after thorough flushing with hose, the charcoal must be heated to redness under cover, in order to destroy the organic matter. From what has been said, no filter affords absolute freedom from microbes. This is not only true of the materials already referred to, but also of *cafeal* (a mixture of iron, charcoal, and clay), *wool*, *felt*, and *sponge*. It is claimed, however, that *glass wool*, *asbestos cloth*, and *unglazed burned earthenware* will remove all germs; there is no doubt that finely spun and pulverized glass wool, or asbestos pressed firmly into a cylinder, will

accomplish this purpose for a time at least. "Breyer's microbe-membrane filter" is made on this principle, but Uffelmann's experiments have shown that whilst this filter is capable of entirely freeing of germs 100 liters of water per day for six days, after that time the number of microbes in the filtrate increased from day to day.

The "Pasteur-Chamberland filter" is made of five or six solid, porous, earthenware cylinders, surrounded with a metallic case, which is screwed on to the faucet, and the water is forced through the pores of the earthenware cylinders, and appears perfectly free from all suspended matter, and for a few days also free from bacteria and their spores. As it acts purely mechanically there is no alteration in the chemical composition of the water; but Uffelmann claims that even this filter loses its eliminating power for micro-organisms after five to six days' use.

According to Parkes the essentials of a good filter are:

(1) That every part of the filter shall be easily got at for the purpose of cleaning or renewing the medium.

(2) That the medium have a sufficiently purifying power and be present in sufficient quantity.

(3) That the medium yield to the water nothing that may favor the growth of low forms of life.

(4) That the purifying power be reasonably lasting.

(5) That in the construction of the filter itself there shall be nothing capable of undergoing putrefaction or of yielding metallic or other impurities to the water.

(6) That the filtering material shall not be able to clog, and that the delivery of the water shall be reasonably rapid.

We may add that the most important object of a filter is the elimination of pathogenic bacteria, and, in order to do this effectually, filters must receive greater attention as regards cleansing and renewal than they have heretofore. It is perfectly evident that filters formed of loose particles, which give a more rapid delivery of water than finer materials, cannot be depended upon for the elimination of germs. Whilst the sand filters render the most effective service for the purification of water on a large scale, and the asbestos filter of Breyer and the Pasteur-Chamberland filter for domestic use, yet the English River Pollution Commission is doubtless correct in declaring that all the methods of purification by filtration have so far been inadequate to prevent the propagation of epidemic diseases by water. We may also fully indorse their concluding opinion, that "nothing short of abandonment of the inexpressibly nasty habit of mixing human excrement with our drinking water can confer upon us immunity from the propagation of epidemics through the medium of potable water."

When we consider how very minute the specific bacteria really are, we need not wonder that they can readily pass through the filters of nature and the filters of man, without any effort of squeezing. In the epidemic of typhoid fever at Laussen, it was shown that specifically infected water had passed under ground for a half mile and contaminated a spring. In this instance the proof was made by a solution of chloride of sodium, and afterwards flour; the saline mixture found its way into the spring, but not the starch, all of which indicates that whilst filtration prevented the passage of finely ground flour previously mixed with water, it was not capable of removing the specific germs of the disease.

In our present state of knowledge, it would appear that nothing short

of boiling or distillation can be relied upon to render polluted water harmless, and a good plan in the household is to boil the water first and then pass it through an aërating process; even simple agitation of boiled water will improve the taste, or in the absence of a more elaborate process, the air can be introduced by a bellows.

DISTRIBUTION OF WATER.

In our discussion of rain water, springs, lakes, streams, rivers, and wells, we have dwelt with sufficient length upon the various sources of collection, and also disposed, so far as rain water is concerned, of the subject of storage in cisterns, tanks, etc. The question of storage and distribution in city waterworks needs our attention for a few minutes.

The amount of storage required naturally depends upon the amount of water used and the facilities for replenishing it. We can readily calculate the space required when these conditions are obtained, namely: the number of gallons required daily for the whole population must be divided by 6.23 to bring into cubic feet, and multiplied by the number of days which the storage must last; the product is the necessary size of the reservoir in cubic feet (Parkes). Reservoirs are usually divided into receiving and distributing reservoirs. In the former, the water having been pumped in, or conducted from natural channels, is permitted to settle, depositing more or less of its suspended impurities; the water is then passed over the filter-beds to the high or distributing stations. It is needless to reiterate here that whatever the size of reservoirs, they should be kept scrupulously clean and free from all sources of contamination; they should be covered, well ventilated, and rather deep, for the purpose of lessening evaporation and securing coolness. It is an open question whether, in the periodical cleaning of reservoirs, it is wise to disturb water-plants which grow in them, as some, like the protococcus and the clare, give out a certain amount of oxygen, and thus aid in the rapid oxidation of objectionable organic matter. Other plants, like the duckweed and some of the nostoc family, give rise to disagreeable odor and taste. In all cases of doubt it is best to remove some of the plants, place them in pure water, and determine whether they increase the amount of organic matter in water. When the houses are removed from sources of water, the supply should be conveyed in aqueducts and pipes; any other method is crude and objectionable. We have already referred to the colossal aqueducts of ancient Rome, and it may be well to mention that the modern city of Rome is to-day the best supplied city as regards water in the world. This has been accomplished by a thorough renovation of the ancient *Agua Marcia*, *Agua Felice*, *Agua Vergine*, and *Agua Paola*, which together supply not less than 3,000 liters, or about 800 gallons, per head, daily.

The public in towns and cities of this country is now very generally supplied by well-regulated water companies. The supply for villages, isolated houses, and farms has been discussed in connection with wells, springs, etc.

The water from public works in the United States is distributed from the reservoirs by means of iron pipes. As iron pipes are liable to rust, and to clog from accumulated rust, not to mention the absolute corrosion, the interior of the pipes should be coated with hot pitch, tar, or vitreous glass. The magnetic oxide of iron produced on the surface of

the metal by "Bariff's process" is also employed. The practice of calking the joints with tow or gaskin next the interior of the pipe, and then running the joint with molten lead, is no longer tolerated; the pipes are screwed together, and in the case of mains large enough for a man to enter, the inside of the joint should be pointed with Portland cement.

The amount of leakage is great enough, without carelessness. Leakage often takes place from uneven settling of the ground after laying the pipes, or from the vibration of heavy traffic, causing fracture of the pipes and joints. Parkes tells us that in London fifteen gallons out of the thirty-five supplied per head daily thus run to waste in the soil. The amount of waste is, of course, greatly influenced by the pressure. For the purpose of detecting such leakages, meters have been designed, which are placed on each district main; they register the flow by day and night, and as very little water is consumed during the night season, it can be safely concluded that the amount registered, or at least the greater portion of it, is running to waste. The exact spots where the leakages are taking place can be determined by the vibrations produced thereby in the nearest house-communication pipes, which can be distinctly heard by applying the ear to the pipe, and frequently without doing so.

The house-communication pipes are generally of lead. Hygiene cannot approve of their employment, for they are liable to be acted upon, especially by soft water, and in consequence there may be danger of lead poisoning to the consumer. On the other hand, it is claimed that hard waters containing salts of lime and magnesia, either have very little solvent action on lead, or they quickly coat the metal with sulphate or basic carbonate of lead, which prevents further action. Odling suggests that whilst new lead pipes are acted on by soft waters, forming a soluble oxide of lead, this ceases after awhile, owing to a coating of carbonate of lead, the only exception being waters which are quite free from silica or its compounds. In the water supply of Glasgow, from Loch Katrine, it would appear that there is a deposit of peaty or vegetable matter, which prevents all further action of the water upon the metal, though the original water acts most powerfully upon lead.

Other observers claim that the soft, highly oxygenated waters, and those containing organic matters, nitrites, nitrates, and chlorides, are those which have the most solvent action on lead. In our present state of knowledge, it is simply fair to state that hard waters have little or no solvent action on lead, whilst soft waters are liable to do so, especially soft oxygenated waters derived from an intermittent service. We are not prepared to deny or admit that the action of soft water ceases on lead after a few weeks, or whether free carbonic acid favors plumbo-solvent action or not, neither can we explain at present the rôle which nitrates and chlorides play in this matter. The Sixth International Congress for Hygiene condemned the use of leaden pipes, and also imperfectly-tinned leaden pipes. Where lead poisoning is feared, a block-tin pipe should be substituted for the lead pipe, and if this is not done, the water in the house pipes should be run to waste every morning.

The supply of water to houses has been conducted on two systems, the *intermittent* and the *constant* service; which simply means that in the former the flow of water in the mains is stopped, except for a few hours every day, requiring, therefore, provisions for the storage of water on the premises of the consumer, whilst in the constant service, the mains being

always turned on, no storage facilities are required, except small tanks for the flushing of water-closets. When we remember the various causes liable to contaminate the water stored in cisterns, tanks, barrels, buckets, etc., it needs no argument to condemn the intermittent supply. Even if it could be tolerated in well-regulated houses, think of this service in the homes of the poor, the tenement houses of great cities, where the water is often stored in the most filthy receptacles. Fortunately for Americans, we have a better water service than England and some continental countries. The constant service is being rapidly introduced into English towns; over one hundred and fifty towns and the greater part of East London are now provided with a constant service, and the results have been especially beneficial to the poorer classes. Such a service, to be of real merit, must of course deliver sufficient water at all times, and not merely delude us with the name.

All the leaden service pipes of a house should be strong (12 pounds per yard for 1-inch pipes and 6 pounds per yard for $\frac{1}{2}$ -inch pipes) in order to withstand the constant pressure. If this pressure is maintained in the mains by pumping, and not by high level reservoirs, greater power must be used in the morning, as the greatest quantity is consumed at that time.

In this connection it is well to refer to the fact that when water mains and sewers are laid in the same trench, there is a possibility of foul matters which have escaped from leaky sewers being sucked into the water mains during intermissions in the service. The remedy is obvious: the water and sewage systems should be kept apart as far as possible.

ICE AND ARTIFICIAL CARBONATED WATERS.

Before dismissing this subject, it is proper to refer to the matter of ice, which plays such an important rôle in American households. The "pernicious ice-water pitcher" of Dr. Hammond is not only objectionable because of the bad effect of a low temperature on our digestive organs, but also because of the impurities likely to be contained in the ice. I have seen, time and time again, persons of intelligence use nothing but melted ice, with the firm belief that they were taking the purest of water, forgetting entirely that whilst some of the organisms are destroyed, others retain their vitality, and that, broadly speaking, freezing does not eliminate the organic impurities. The fact is that ice obtained from "a pond or river which is unfit as a water supply, is equally unfit for use." Ice water should contain no perceptible suspended matter, very little dissolved matter or chlorine, and the albuminoid ammonia should not exceed 0.005 part per 100,000.

The number of micro-organisms found in ice depends first upon the purity of the original water, and secondly upon the length of time the ice has been kept. This has been demonstrated by various investigators. Neger found that 1 cc. of river ice, frozen January 4, 1887, contained 440 germs. He examined 3 days later and found 273 germs per 1 cc.; after 6 days, 180 germs per 1 cc.; after 9 days, 40 germs per 1 cc.; after 13 days, 6 germs per 1 cc.; after 15 days, 2 germs per 1 cc.; after 20 days, 4 germs per 1 cc. Prudden's interesting experiments (Med. Record, March 26, 1887) show that 1 cc. of water contained 6,300 germs of the *Micrococcus prodigiosus*. He subjected this water to freezing, and found that the ice contained after 4 days, 2,970 germs; after 37 days, 22

germs; after 51 days, 0 germs. The results with water containing the germs of *Proteus vulgaris*, and another sample containing the bacilli of typhoid, were even more striking. All of which emphatically indicates that the presence of bacteria in ice depends largely upon the length of time the ice has been frozen. There can be no question as to the comparative purity of artificial ice manufactured from distilled water, in which Fränkel only found from 0 to 14 germs, and Uffelmann from 0 to 22 per 1 cc.

Now, whilst it is true that so far no pathogenic bacteria have been found in ice, their presence is at least possible if contained in the water previous to its freezing. Prudden kept the ice frozen from water containing typhoid bacilli for 103 days, and at the expiration still found 7,300 per 1 cc. Neger has shown that the bacilli of anthrax retain their vitality in ice for 14 days, and Friedlander's pneumonia cocci about a week. These observations are certainly suggestive of danger from impure ice, and for this reason preference should be given to artificial ice made from distilled water. In this connection I may relate an amusing incident of my frontier life. Last summer I visited almost every evening the family of a professional friend. About 9 o'clock regularly the punch or lemonade bowl appeared. I invariably declined the tempting beverage because the ice supply was obtained from a polluted ice pond. After the refreshments each of the three adults, my good friend the doctor included, would take one or two five-grain capsules of quinine, as they "all had symptoms of malaria." I finally suggested that the organic impurities contained in the ice might possibly produce the symptoms complained of, and they contented themselves thereafter with cooling the beverages by setting them on the ice. The symptoms of malaria soon disappeared.

Carbonated Water.—We have already seen that water rich in carbon dioxide is especially pleasant to the taste, and exerts a good effect on the digestive functions. These waters are either natural or artificial, and as they are largely consumed for medicinal and dietetic purposes, it is proper to present here the results of studies made in reference to the amount of carbon dioxide, and the number of micro-organisms contained in such waters. The natural carbonated waters contain between 200 and 2,000 cc. of free CO_2 per liter. No examination has been made to determine the number of germs in natural carbonated water, but Leone found in freshly prepared artificial water, 186 germs per 1 cc.; after 5 days, only 87 germs; after 10 days, 30 germs; after 15 days, 20 germs. This author attributes the disappearance entirely to the fatal effects of CO_2 on the microbes. Sohnke observed a similar diminution, especially when the bottles were supplied with patent stoppers, whilst ordinary corks afforded no such results. Hochstetter, quoted by Uffelmann, however found that samples of artificial seltzer water contained from 10 to 75,000 germs per 1 cc. when taken from bottles with patent stoppers, and even more when taken from bottles with common corks. He also found that the number of micro-organisms increased rather than diminished by keeping. In his experiments, conducted in the Imperial Health Office at Berlin, he demonstrated that the bacilli of septicæmia, cholera, and anthrax survived in this water but a few hours, whilst the bacilli of typhoid retained their vitality for days and

weeks, and the spores of the bacilli of anthrax showed no loss of vitality after several months.

Hellwig reports an outbreak of enteric fever in 1884, in the city of Mayence, Germany, which affected only persons who had been drinking artificial seltzer water from a certain establishment. Investigation revealed the fact that the water used was taken from a well notoriously impure and polluted with sewage from a cesspool which had received the evacuations of a typhoid patient. Whilst there was no bacteriological proof that the water contained the bacilli, it is highly probable that the germs of typhoid were transmitted in the artificial mineral water prepared from this infected source.

For this and the additional reason, that carbonic acid naturally favors putrefaction of organic matter, it is certainly high time that these artificial carbonated waters should be prepared from distilled water.

PROCEEDINGS
OF THE
SECOND ANNUAL SANITARY CONVENTION
OF
CALIFORNIA.

HELD AT SAN JOSÉ, UNDER THE AUSPICES OF THE STATE BOARD OF
HEALTH, APRIL 16, 1894.

STATE SANITARY CONVENTION.

The Second Annual Sanitary Convention, held under the auspices of the California State Board of Health, met in Germania Hall, San José, on Monday, April 16, 1894, and was called to order by Dr. H. S. Orme, of Los Angeles, Past President, the proceedings being opened with prayer by Rev. R. S. Cantine, of San José.

The President then introduced Hon. H. E. Schilling, Mayor of San José, who delivered the following address of welcome:

MR. CHAIRMAN, LADIES AND GENTLEMEN: It is with the greatest pleasure that I have the pleasant duty to perform to-day of extending to the members of the State Sanitary Convention and the State Board of Health of California an earnest welcome, in the name of the people of San José. Coming as our visitors do from the different localities of the State of California, and representing the organization formed for the promotion of health, and thereby happiness—the two great pursuits of the human mind—I can assure them of the earnestness of their welcome, without any thought other than that of honor and friendship for them and their business in behalf of the people of our State. Again, ladies and gentlemen, I extend to you the most earnest welcome in the name of our city, and I hope that there may be naught but pleasant recollections of your stay amongst us. [Applause.]

President Orme responded: We thank the Mayor for this kind and hearty welcome, and it again becomes my privilege to inaugurate another session of this our Sanitary Convention, so auspiciously begun one year ago. In this interval we are to be congratulated that the threatened visitation of cholera, which was then the chief ground of apprehension, has been happily averted, and we have been spared the trouble of meeting the invader at our borders. We are not to conclude, however, that the preparation made to face the emergency has been useless. Our Government maintains an army and navy to repel the invasions of enemies who are far less likely to come than is cholera, and these forces keep up a constant exercise of their maneuvers so as to be always prepared for emergencies, which is more than our health authorities have felt warranted in doing.

While we have escaped the more dreaded pestilences, cholera and smallpox, we have not been able to suppress la grippe, or influenza, which has for four years held its ground among us, and has shortened the lives of thousands. Though less rapidly fatal than cholera, and therefore less alarming, it has probably caused more deaths than the last visitation of cholera, which reached this country in 1873. How to control this distemper, which is fairly to be presumed to be produced by a peculiar microbe, like that causing cholera and the infectious fevers, is a problem that confronts both curative and preventive medicine. Surely our four years' experience has not taught us how to avert it, and hardly improved our means successfully to withstand it.

Another problem, and one which may chiefly, and I trust hopefully, be considered at this meeting, is the repression of tubercular diseases. They are now fully recognized as infectious; their mode of communication is fully understood; their method of prevention is no secret. Our duty lies in prevention, and our proceedings should be on the line of educating the public, and awakening a general effort to avoid and prevent practices that tend to the dissemination of the germs of disease through our common atmosphere, and prevent their admission to our daily food and drink.

And now I must not fail to acknowledge my sense of the high honor conferred upon me at the inauguration of this session, of presiding over its deliberations, and I now have the pleasure of asking you to nominate my successor, who will preside over this meeting. [Applause.]

Dr. William H. Mays, of San Francisco, nominated Dr. C. A. Ruggles, of Stockton, whom he styled one of the foremost and most enthusiastic workers in sanitary science in the State, one who had for years devoted nearly all his time and attention to preventive medicine and sanitary science, who had for years been the chief Health Officer of Stockton, and by his efforts had revolutionized the sanitary condition of that city.

Dr. Winslow Anderson, of San Francisco, seconded the nomination, and on his motion the nominations were declared closed, and Dr. Ruggles' election declared unanimous.

The organization was completed by the election of Dr. J. H. Carothers, of Martinez, First Vice-President; Dr. J. R. Curnow, of San José, Second Vice-President; Dr. Winslow Anderson, Secretary.

Dr. C. A. Ruggles, the President elect, then delivered his address.

On motion of Dr. Winslow Anderson, a committee of three was appointed on publication. The Chair named as such committee Drs. J. R. Laine and W. F. Wiard, of Sacramento, and Dr. Winslow Anderson.

Dr. George C. MacDonald, of Sausalito, read a paper on "Contagious Diseases; their Suppression by Legal Measures," which was referred to the Committee on Publication.

Dr. J. H. Stallard, of San Francisco, followed with an elaborate paper on the "Ultimate Disposal of Sewage, with Special Reference to San Francisco."

Dr. Alfred E. Regensburger, of San Francisco, next held the floor with a vigorous paper on "Cremation."

The doctor introduced the resolutions concluding his paper, which were seconded by Dr. Orme, and, on the suggestion of the Chair, the discussion of them was deferred until evening.

Dr. H. S. Orme, of Los Angeles, Past President of the State Board of Health, then read a paper on "Sewage Irrigation."

Dr. J. H. Davisson, of Los Angeles, a member of the State Board of Health, presented a paper on "Sanitation of Dwellings, Public Buildings, and Thoroughfares."

Following this came Dr. Walter Lindley, Superintendent of the Whittier State School, Whittier, with a paper entitled "Indio; The Colorado Desert as a Health Resort."

Dr. Cephas L. Bard, President of the Southern California Medical Society, and Health Officer of Ventura, read an elaborate paper detailing "The Ravages of the Bacillus Anthracis in California."

Dr. Orme spoke as follows: As the President of this convention in

his address has alluded to the subject of school hygiene, I would say that at the last meeting of the State Medical Society a special committee was appointed for the purpose of urging upon the public school authorities in the State of California the importance of betterment in the teaching of physiology and hygiene in our public schools. As a member of the committee I am sorry to say that we have labored with but indifferent success; still we do not despair. In view of the importance of a better knowledge of the principles which underlie the preservation of health to the rising generation, I venture the opinion that the subject is appropriate for the consideration of this convention, and therefore move its reference to a special committee, with instructions to report at the evening session of the present meeting.

The suggestion was adopted, and the Chair named as the committee Drs. Stallard, Anderson, and Franklin.

A recess was then taken until 7 o'clock in the evening.

EVENING SESSION.

The proceedings opened with a paper by H. A. Spencer, V.S., of San José, on "Sanitary Legislation," which was referred to the Committee on Publication.

C. B. Orvis, D.V.S., of Stockton, followed with a paper on "Glanders, and the use of Mallein as a Diagnostic Agent." The President, Dr. Ruggles, prefaced the paper with the statement: A great disappointment is mine in connection with this matter. I had made arrangements with Dr. Orvis that the cattle at the State Asylum should be subjected to diagnostic tests for tuberculosis. I have communicated with the Bureau of Animal Industry at Washington for the purpose of getting a reliable article of tuberculin, thinking that the tuberculin would arrive so that we could make a report to you to-night after using it. It has not arrived, but I assure you that as soon as the article does arrive these experiments will be conducted by the State Board of Health, with the assistance of Dr. Orvis, and a printed report of it will be made and furnished to the medical journals. [For tests, see pp. 183-187 of this report.]

"Sanitation from the Standpoint of a Plumbing Inspector," by W. W. Oates, Plumbing Inspector, Stockton, was the next paper presented.

Dr. J. R. Laine, of Sacramento, offered the following:

Resolved, That hereafter consumption and other diseases due to the bacillus tuberculosis should be included in the list of diseases dangerous to public health, requiring notice by householders and physicians to the local Health Officer as soon as such disease is recognized.

In explanation and support of the resolution Dr. Laine said: My reason for introducing a resolution of this character at this time is in order that it may be considered in connection with the papers read and to be read on the subject, and a thorough discussion had. I believe that while the majority of people will not dispute the contagiousness of tuberculosis, yet there must be an agreement on the part of the profession that there is danger from this cause, and if there be an announcement by a body of this character, it can then go forth to the people as the views of the profession, and they may accept it as fact. I move the adoption of the resolution, but I believe it would be proper to first read

the papers on the subject and then discuss the resolution on its merits.

This course was decided upon, and Dr. W. F. Wiard followed with a very able paper on "The Prevention of Consumption."

Dr. S. S. Herrick, of San Francisco, read a paper on "The Prevention of Tubercular Diseases."

Then, on the suggestion of the Chair, in order to have a change of thought, Dr. William F. McNutt, of San Francisco, was invited to read a paper prepared by him, entitled "Cremation; the Only Sanitary Method of Disposing of Dead Bodies."

The regular work in the section was then resumed, Dr. Winslow Anderson, San Francisco, reading a paper on "The Prevention of Contagious and Infectious Diseases, with Special Reference to Tuberculosis."

The last paper of the session was by Dr. George M. Kober, Post Surgeon, Fort Bidwell, entitled "A Plea for the Prevention of Tuberculosis."

The Chair suggested that as it was getting late, and there were yet two more papers on the same subject, one by Dr. L. Q. Thompson, of Gridley, "Consumption is Contagious," and the other by R. A. Archibald, D.V.S., "The Relationship between Human and Bovine Tuberculosis," and as they would be in the nature of what the lawyers call cumulative evidence, he moved that they be read by title and referred to the Committee on Publication, which was done.

The previous question was then moved on the adoption of the resolution offered by Dr. J. R. Laine, which was seconded by Dr. Winslow Anderson, and the resolution was adopted unanimously.

Dr. Ruggles called for the report of the Committee on School Hygiene, and Dr. Stallard, chairman of the committee, presented the following:

Resolved, That a petition be addressed to the Legislature providing for the appointment of a competent physician to teach personal and domestic hygiene in the State Normal Schools, and that attendance on these lectures be made compulsory and a part of normal education.

Dr. William Simpson, of San José, said: "As a further point in that direction, wouldn't it be well for this convention to go a little bit farther and suggest that the State in teaching its teachers should appoint in the Normal Schools of the State a lecturer on hygiene? A large majority of the teachers in the public schools are graduates of the State Normal Schools; a very large proportion of them the State teaches free of expense. The teachers are instructed there, and before they enter the public schools as teachers they receive their education from the State at these points. My suggestion simply is that this convention recommend to the State the appointment in the State Normal Schools of a lecturer on hygiene, so that before the teacher receives a certificate entitling him or her to teach, he or she will receive from the State some instruction in this direction."

Dr. Stallard said he should be very happy to accept any modification that the convention desired made.

Dr. C. A. Ruggles said: "I look upon the action as rather coöperative with the resolution introduced by the State Medical Society a year ago to-morrow. That resolution was on the necessity of teaching hygiene in the public schools. How we are going to get at that I do not quite know. I had a conversation with the State Superintendent in relation to that matter, and I am free to admit I was very little encouraged by the result of the conversation, and naturally I elevated my spinal col-

umn a little bit, and told him we would compel him by legislation to teach hygiene in the public schools. I believe the way to gain that is to begin at the Normal Schools, over which the State has control, and make it obligatory by legislation, if necessary, that hygiene shall be taught to the young of this State." [Applause.]

Dr. Stallard accepted the suggestion, and the resolution as amended was adopted unanimously.

Dr. Winslow Anderson called up from the table the resolutions offered at the afternoon session by Dr. A. E. Regensburger in regard to cremation.

The resolutions, which were as follows, were adopted unanimously:

Resolved, That this convention indorses and approves of cremation as a rational and sanitary means for the disposal of the dead.

Resolved, That all legal restrictions to it, where they are in force, should be removed.

Resolved, That governments should employ it on the battle field in lieu of inhumation.

Resolved, That it should be adopted in all cases of infectious and zymotic diseases and during the prevalence of an epidemic.

Resolved, That it should be made obligatory in all cases of Chinese decedents, where it cannot be shown satisfactorily that they were under the observation and treatment, for their last illness, during five days preceding their demise, of a duly licensed physician and surgeon under the laws of the State of California.

Dr. Thomas Malloy offered the following:

Resolved, That it is the sense of this convention that laws for the suppression of contagious and infectious animal diseases should be enacted by the next Legislature; that the office of State Veterinarian should be created, and a competent veterinarian appointed to perform the duties of the office; be it further

Resolved, That the State Board of Health give the same its earnest attention and support.

Dr. Laine remarked that as the law now stands the Board of Health may appoint a veterinarian, but there is no provision to pay him for his services. Now animals may be prohibited admission to the State upon inspection. It is unnecessary to appoint a State Veterinarian for that purpose. It can be done at any time, and any State appropriation is unnecessary, for the law provides that any funds at the disposal of the State in the General Fund may be used for that purpose. To create the office of State Veterinarian would be to have another official, who must be paid. We have power to appoint him, but not to pay him.

Dr. Bowhill argued in favor of prompt action. It is admitted in all the papers, he said, that milk is necessary, and that it is a great source of contagion; that the milk of tuberculous cows affects the young child who uses it. In San Francisco and all other large towns there are many tuberculous cows whose milk goes into the milk supply. There is also the danger from glanders. Under the circumstances it is our duty to mankind, it is peculiarly the duty of the State Board of Health, to have diseased cattle examined. We have the milk of these tuberculous cows rushed into the market and supplied to consumers. There is no guard taken. The inspection is a farce. I read the other day of where it was done by a milk inspector. It might as well be said that an insurance company should leave the whole business of risks to be attended to by a clerk. I think there should be an officer for this particular purpose supported by the State Board of Health.

Dr. Maclay said he did not know what the law was until told by Dr. Laine. The object of the resolution is simply to get the assistance of the Board of Health to procure the necessary legislation. If we are going to have a law introduced and use our influence to get it passed,

providing for a salary for a State Veterinarian, the object of the resolution is simply to get the assistance of the Board of Health. I think the law ought to be established. There is a vast amount of disease in this State that people do not know about. Glanders, I can assure you, is very prevalent, and it is a very deadly disease, as you know.

Dr. Davisson remarked: As a member of the Board of Health I am rather in sympathy with this movement, for one reason in particular, and that is that Dr. Ruggles and I met the head of the Department of Animal Industry in Washington, and they know and seem to care but little about animal disease in California, as he told me himself; he had not been out here, and he really did not know what we did have out here. Distinguished sanitarians, among whom are Sternberg and Lloyd, make the statement in their book that such diseases as we are dealing with here do not exist in the United States. I submit that the State Board of Health of California should take an interest in this subject. As far as I am concerned, I feel favorable, in the absence of anybody else to do it, to leaving it to a State Veterinarian.

Dr. H. S. Orme said: I hope the resolution will be carried, because at the last meeting of the Sanitary Convention there was a resolution introduced, you know, requesting our Congressmen to petition Dr. Salmon to establish branches of the Bureau of Animal Industry on the Pacific Coast. As it is now, we have none.

Dr. Simpson said: I think this resolution should be altered a little, with the consent of the mover, so that it would cover the ground. As it reads, it is that laws "for the suppression of contagious and infectious animal diseases should be enacted, and the office of State Veterinarian should be created." As I understand it, this office is already created. Now, by changing the wording of this resolution so that it would read that the necessary legislation be requested to provide sufficient funds for the support of the office of State Veterinarian—would that cover the ground?

Dr. Simpson said that if the money could be provided he had no doubt the State Board would appoint the officer.

The mover accepted the proposed amendment. The resolution as amended was adopted unanimously.

On motion of Dr. Ruggles, the convention adjourned to meet at the call of the State Board of Health one year hence.

ADDRESS BY DR. C. A. RUGGLES,

President elect, and President of the State Board of Health.

One year ago to-day it was my very pleasant duty as temporary presiding officer to introduce as the President of the first sanitary convention held in California my much respected friend, Dr. Orme, of Los Angeles. Now he has had an opportunity to reciprocate the compliment by introducing me as your President. So honors are easy. I will not use the old, very old, and much worn expression, that this is the proudest moment of my life, even if I thought so; but simply, with heart-felt emphasis, say to you that I am extremely grateful for the honor thus conferred. It has been my privilege during the many years of active life to often preside over deliberative assemblies, both municipal and political. But this is the only time that I have been honored by being selected to preside over a convention of this distinguished character. So on that account I claim your kind indulgence, and ask you to overlook my many shortcomings.

A member of the State Board of Health, who takes a very great interest in sanitary matters, had had a very good opportunity to become familiar with the proceedings of other State Boards of Health, and had read much of the reports of sanitary conventions held under the auspices of those Boards. He became much interested, quite fascinated with them. Soon the thought arose in his mind, if Iowa, Kansas, Michigan, and others can have these conventions and make them so interesting and instructive, doing so much good by telling and showing the people not how to *cure*, but how to *prevent* disease, "why cannot California do the same?" That thought, on being uttered, immediately met the hearty concurrence and coöperation of the entire Board, and one year ago that thought found material expression in our first sanitary convention; an experiment, to be sure, but in the language of our worthy ex-President, Dr. Orme, it was highly profitable and successful, and my sincere desire is that yearly, and oftener if possible, each may improve upon its predecessor and steadily and surely gain the confidence of the medical profession and all who take any interest in sanitation.

At our convention held one year ago, it will be remembered that the subject of Asiatic cholera monopolized our time, almost to the exclusion of other matters. Probably it was right to have been so arranged, but fortunately that condition does not now exist. The emergency justified any effort at that time to prepare our people for the expected invader, and I most heartily congratulate the State upon its escape. Though much preparation as to money and means had been made for our protection, unnecessarily it would appear, yet I can assure you that there will be no relaxation in sanitary measures on the part of the State Board of Health for the ensuing season. In this connection I wish to say a few words in relation to the preventive measures taken by the Government.

I was honored by Governor Markham with the appointment as representative of California to the Pan-American Medical Congress, which met at Washington, last September. While in Boston, en route, I saw that cholera was reported to be in Jersey City. My duty was immediately made very plain to me, and soon I was in Jersey City, and from Surgeon-General Wyman and Surgeon Bailache, U. S. M. H. Service, and Secretary Hunt, of the State Board of Health of New Jersey, I received every courtesy possible and was enabled to telegraph to our most worthy Secretary, Dr. Laine, daily, the exact condition. Then and there I saw the greatest anomaly of the present time, especially so considered when we daily hear discussions about States rights and other like matters. It was the unity of action of national, state, and municipal sanitary bodies, all blending into one harmonious whole, without the slightest degree of friction or harshness. That I was pleased is a feeble expression of thought, and I did hope that if ever California was similarly threatened by such a foe, we might, with great profit, follow an example so successfully set by New Jersey. And I take great pleasure at this time and in this public manner to mention my obligations to those gentlemen for many acts of kindness and courtesy shown to me, *not personally*, but as a representative of California in sanitary matters. It was my privilege to be informed of the complete and perfect system of procedure by that branch of our Government as to inspection and disinfection in foreign countries, as it were, at the beginning of danger, and I unhesitatingly say that too much credit cannot be awarded to the Marine Hospital Service, under the control and personal supervision of Surgeon-General Wyman, for our fortunate exemption from Asiatic cholera.

I am not justified, possibly, in saying that cholera has been overestimated, and that too much importance has been placed upon that disease. But I do say, and defy successful contradiction, that some of our well-known communicable diseases have been too much *underestimated*—too little thought of; too little importance by comparison has been given to them, at a disastrous expense to the community. The mention of a case of cholera will set in motion all known sanitary machinery of nation and State and city, while all around, and, like the poor, always with us, are those diseases which, by their universality and frequency, have so familiarized themselves with us as to cause no dread, no great fear, and by comparison with that bestowed upon cholera, exciting very little attention, and yet many fold more disastrous in their results than cholera and yellow fever combined.

With very great fervor do I most heartily indorse the sentiment expressed by Medical Director Gihon in his admirable sermon delivered to the Section of Hygiene of the Pan-American Medical Congress assembled in Washington, September, from the text from Luke, iv, verses 41 and 42, with which most of you are undoubtedly familiar, which says in substance: "Remove the beam from your own eye before you behold the mote in your brother's." Of course, it is easily perceived that he means to be understood that we had better look at home and around us and examine closely into our condition as relates to tuberculosis, diphtheria, and other communicable diseases—large beams in our own eyes—than to go abroad to spy out and pick up small fraternal motes like cholera, a strictly foreign production, against whose introduction into the United States a high, *very high*, protective tariff should be instituted. The sentiments therein expressed have grown and

increased as the months pass away, and were it not for fear of being accused of plagiarism, I would like to speak further on it; but you can read it yourselves, as it is published in all the sanitary and medical journals of the day.

In the natural order of sequence I am now brought to the consideration of tuberculosis, *one of Dr. Gihon's big beams*. It is my great care to avoid saying anything that by anticipation may interfere with what any member of this convention may intend to say. You have all received a notice of the intended introduction by the State Board of Health of a resolution relating to tuberculosis. I wish to say that, personally, I am very much in favor of its adoption. My feelings on that point are very positive, and I most urgently call your attention to it, hoping it will receive a free and full discussion, for certainly it is of vast and almost incalculable importance to our State, which appears at this time particularly to have become the tubercular sanitarium for the whole country.

A subject of great importance which I wish to present to your attention and ask your deliberate consideration, is the communicability of disease from animals to man, especially tuberculosis from the cow and glanders from the horse. At our last convention an admirable paper was read by Dr. F. A. Nief, a portion of which related to the above suggestion. It is possible that some there were, like myself, who did not pay the requisite attention to the paper that it deserved; to such my advice is "get it and do as I have done," read it carefully and studiously, and we will agree that the doctor did present a very important subject, and one that should receive your earnest consideration. That the milk from a tuberculous cow is the medium through which that disease is communicated to children, no one will deny who is properly informed on that subject. That there should be some legal restriction amounting to total prohibition as to its sale and use, will at once be admitted. But before that can be brought about there must be established some diagnostic method by which we can assure ourselves, as well as others, of the existence of that disease in the cow. The same suggestion is of equal weight in relation to glanders, which too often is allowed to exist under a less offensive name, threatening by the possibility of its transmission to man the very safety of humanity. The diagnostic value of tuberculin for detection of tuberculosis in cattle, and of mallein for glanders in horses, should be affirmed by you, and all possible encouragement be given to our veterinary brethren to continue in their experiments to satisfactorily establish the value of the hypodermic use of those articles in suspected animals.

I cannot find words to sufficiently express my admiration for the efforts put forth in that branch of investigation, for daily facts are brought to our notice which cause much alarm, and very much increase the great necessity of action by all sanitarians. Many foreign governments have accepted and adopted this diagnostic method, notably Russia, Germany, and France. President Cleveland in his message to Congress says: "Investigations have been made during the past year as to the means of its communication [referring to tuberculosis in cows, and the method of its correct diagnosis]. Much progress has been made in this direction, but work ought to be extended, in coöperation with local authorities, until the danger to human life arising from this cause is reduced to a minimum."

Many of you gentlemen whom I have the pleasure of meeting here I know have, from sincerity of thought and purpose, made many sacrifices to be present. The question at once arises, What good is to be derived from our meeting? As was stated one year ago, the State Board of Health wishes to be brought into closer relation with the local Boards, so that with unity of purpose, in accordance with settled plans of action, much more may be accomplished in sanitary matters. By meeting together we each impart to the other some one or more new ideas, and by mere attrition brighten up and are better prepared to meet any sanitary question so liable to arise daily. Our action deserves and will receive the confidence of the people, who see and realize that we are, so to speak, legislating in their behalf. Often does the question arise to him who has made the sacrifice of thought and action, "What encouragement is presented to justify this continued expenditure of time and thought?" Allow me briefly to say why, in my judgment, we should "persevere and faint not." More than a century ago one of the greatest American statesmen said: "We know of no way of judging the future but by the past." Age has not dimmed or diminished the truth of that memorable saying. Let us for a short time turn backward our minds to within the memory of most all of us. What gigantic revolutions have taken place in that which especially interests us! In surgery, in medicine, and in later years in sanitation. Some of us can distinctly remember the horrible preparations necessary to be made for a surgical operation—opium, brandy, straps, and much muscular restraint. Then suddenly came angelic anæsthesia, driving into oblivion and burying in the debris of the past all of the horrors of surgery, and in a pleasant dreamy sleep, no longer dreading the necessity of surgical interference, the patient quietly, cheerfully submits to all that is required. While contemplating the great revolution in that one particular, though I am not as old as I hope to be, I can very distinctly remember the privilege of witnessing the first capital operation performed under the influence of an anæsthetic, November 7, 1846, at Massachusetts General Hospital, by Dr. Haywood. What monstrous strides in progress has surgery later on made! Abdominal surgery particularly. Now the surgeon, with a bravery and confidence begotten by experience, has not much more doubt as to safety and success in opening the abdomen for the removal of ovarian or other tumors than to open the mouth fifty years ago for the extraction of a tooth.

I will not consume time to elucidate my text to judge the future by the past and to offer encouragement for a continuance of our efforts in improvement, but will simply mention some great changes in the administration of medicine. Many will remember the time when catharsis could only be produced by administration of enormous nauseous draughts of salts and senna, or equally disgusting doses of calomel and jalap, which duty is successfully done by a one or two-grain pill of podophyllin. This revolution in medicine and its administration has done more to establish the standing of the homœopath than all the "*similia similibus curantur*." These are a few of the matters involved in revolution, and equally prominent in that line is the very great change or revolution as to the cause of disease, more surprising, perhaps, than what have been mentioned. I think I can safely say that previous to a period not fifteen years ago, very much as to the cause of disease was wrapped in mystery, was very much like guess-work, in comparison to the certainty which

now prevails. Then the attending physician would look very wise, and in a very peculiar air of mystery talk about a "*materies morbi*," of which he knew nothing as to shape, size, or habitat, and would discourse very learnedly about atmospheric influences, and conclude the whole subject with a fanciful tissue of guess-work and "I think so," all of which, by comparison with that certainty which may now be obtained, is none else than groping in the dark. But the most revolting and wicked of all—because it is in direct violation of everything sacred—is to charge to visitation of Providence the death of a loved one from some communicable disease that by ignorance was not prevented. How horrid to contemplate the idea that the beneficent God would cause the innocent child to die of diphtheria as a punishment to a presumably guilty loving mother! Such "bosh" I have heard, and so have many of you, undoubtedly. Very much of this uncertainty, of this doubt, of this guess-work, has been dispelled by the wonderful microscopic researches and investigations carried on within a period of fifteen years. Since 1882, the investigations of Koch, Leßler, and others as to tuberculosis, cholera, diphtheria, and typhoid fever have been omnipotent in dispelling the cloud of uncertainty and guess-work in our diagnoses. Surely a wonderful revolution. Sanitation has received much benefit by this revolving process! What a decided change in public sentiment on that subject.

Our State Board of Health, as well as those of other States, have for quite a period of time done much in expenditure of time, talent, and money in the way of printing and circulating among the people leaflets in relation to many important sanitary questions. Undoubtedly many of these circulars have received the attention desired by the Board. But I am perfectly satisfied that though much good can be and has been done by that method, much more could be accomplished by adding thereto and supplementing personal effort of each one interested in sanitary matters. No one is without *some* influence, and all members of Boards of Health, both State and local, can do much in a missionary way among his own clientele in explaining, each in his own way, the mysteries of things unknown to those unwillingly ignorant. Many there are who cannot read; some will not trouble themselves as to them, preferring other kinds of literature, but will listen attentively to what may be said by the physician in whom they place confidence. And in this connection I do think that for public good all Boards of Health should be composed of medical men capable of thus instructing the people with whom they are brought in contact, as in my judgment our sole and entire hope for the future sanitary success is in instructing the people. Does any one doubt the success of that method? Can we not "judge the future by the past"? In my own limited experience I have met with much to encourage me in that line of procedure. Only a few years ago our local Health Officers were met frequently by the assertion from some old female fossil that diphtheria was not "catching," and who would use every effort by ridicule and almost force to obstruct the Health Officer's attempt to protect the public from contagion, sometimes aided by physicians equally ignorant and much more mercenary, who would secrete cases, and officers be ignorant of their existence. But by municipal compulsory legislation, as to cases being reported by physicians to the Health Officers, a persistent and unwearying method of instruction, and a few sad and bitter lessons in the school of experience

to those poor deluded people, a great revolution has been brought about in the limited sphere where I am somewhat acquainted. Let each person interested tell his friends and neighbors how these communicable diseases are spread, and by what media they can be prevented. Establish a kindergarten for such, and a post-graduate course for the few physicians who, by their professional prominence, are capable of making so much opposition and trouble to health authorities. Such a wonderful revolution has taken place in many localities that the authorities have no trouble in enforcing strict quarantine regulations, each one being willing to submit gracefully to any required personal inconvenience when told that it was for the public good.

The question has been often asked, and probably will be again, "What good is derived from this personal sacrifice for the public welfare? What facts, figures, and statements can be presented to justify this in very many instances great inconvenience?" With much pleasure and satisfaction am I enabled to point to the State of Michigan, whose Board of Health is under direction of its able and indefatigable Secretary, Dr. Baker, in whose statements, from a personal knowledge of the gentleman, I have unbounded confidence.

That gentleman exhibited at the World's Fair at Chicago a diagram representing the restriction and prevention of communicable diseases, and made the statement that, proven by statistics of several years, four fifths of the cases of diphtheria and scarlet fever, and the deaths therefrom, are prevented by the measures of isolation and strict quarantine which the State Board has been insisting upon the past few years. The question necessarily and naturally arises, "If in Michigan such encouraging results of sanitation can be obtained, why not in California?"

At the last session of the State Medical Society, a resolution was introduced and unanimously adopted, wherein was stated the necessity of the introduction of the study of hygiene into the public school system. What was the practical result of that resolution I am not informed, but I most cordially indorse the sentiment therein expressed, and hope that such coöperative measures may be taken by this convention as will result in obtaining the desired object. If the future hope of our country lies in the rising generation, it surely is desirable that it shall be properly instructed in the science of preservation of health. In this connection I wish to call special attention to the circular prepared by Secretary Laine and issued by the State Board of Health, entitled "School Hygiene." I do not hesitate a moment to say that it is a work well worthy of your confidence and indorsement, and one that should be in the hands of every teacher and parent in the State. So positive and sincere am I in that statement, that every teacher and School Director in the city of Stockton and county of San Joaquin received one, and I am glad to say that already I have good reason to believe much good will arise from its distribution.

SEWAGE IRRIGATION.

By H. S. ORME, M.D., of Los Angeles, Cal., Member and ex-President Los Angeles Medical Society, President State Medical Society, ex-Member American Public Health Association, and Member American Medical Association, ex-President California State Board of Health and State Medical Society, and Professor Hygiene, etc., Medical Department of the University of Southern California.

It is unnecessary to adduce to citizens of California the immense advantage of irrigation to most crops. Water, pure and simple, is such a benefit that few stop to realize that a vast amount of fertilizing matter, partly dissolved and partly held in suspension, is suffered to run to waste from all our cities and towns.

The excreta of human beings are far richer in nitrogenous constituents than those of domestic animals, from the nature of our food, and consequently they have a greater value for fertilizing. It is a poor commentary on European civilization that, except in a few instances, the white race has only recently begun to utilize substances which have contributed largely for unknown ages to sustain the dense population of despised China. It is estimated that 100 pounds of human urine are equivalent, as a fertilizer, to 1,300 pounds of fresh horse dung; yet the latter, though vastly more bulky and weighty, is saved, and the former mostly wasted.

The trouble in dealing with human excreta is their rapid decomposition, by which their value is destroyed. It is generally necessary to apply them to the soil within two or three days, and the only practicable way is by water-carriage. If kept moving, the time may be prolonged, so that they may flow for a distance of 30 or 40 miles, if necessary. Another point is, that the volume of water carrying these substances be not excessive, say not more than 50 or 60 gallons daily per capita, or the area of land within reach of a city and available for irrigation would become inadequate.

The utilizing of sewage for irrigation is not entirely new in Los Angeles, but until recently has not been thought practicable during the winter months. The past season, however, has been unusually dry (the rainfall having been only 8 inches), and it has been found that the whole sewage of the city can now be disposed of in this way. Still better, the authorities are now able to charge \$5 per head (100 inches) for the sewage for irrigation purposes during the day, and \$3 for the night. It is estimated that the daily amount of sewage is 14 heads, or 1,400 inches, on the line of the outfall sewer. I might here add that this great outfall sewer to the ocean is now finished, but the laterals and house-connections with the sewerage system are not yet completed. When the latter work shall have been done, Los Angeles will have a public work of which she may justly be proud.

A recent letter from Dr. Henry J. Barnes, of the State Board of Health of Massachusetts, and one of the best authorities in America on this subject, informs me of the complete success of sewage-farming at Framingham, in that State. This is a city of about 5,000 inhabitants.

The system was originally intended merely for intermittent filtration, but a tentative experiment showed its adaptability to fertilizing purposes, and now the land produces magnificent crops of corn, cabbage, etc. Even the vigorous winter climate does not interfere with the operation. Such has been its success, that the sub-surface disposal of the sewage of a penal institution in that neighborhood has been abandoned, and it is now applied to this farm.

To make sewage irrigation a success throughout California, we must profit by the experience of other communities where this plan has been longer in operation and financial victory has been gained. The capacity of land to dispose of sewage irrigation varies with conditions. A porous soil will receive much more than solid clayey ground. Under-drainage greatly increases this capacity; intermittent application of the liquid serves also this purpose. It may be estimated that, with varying conditions, one acre of ground will easily dispose of the excreta of 100 to 400 persons. It has been found practicable to continue this irrigation in the cold winter climates of northern Germany and Illinois, as at Dantzic and Pullman, for the flow keeps the ground from freezing. In the mild climate of Southern California it could be made practicable all winter by intermittent application and increasing the area of ground. The sewage farm at Pasadena, California, only in operation a short time, is a decided success, and will continue so if properly managed, showing to us what can be accomplished elsewhere is possible at home, by using similar methods. Probably the topographical difficulties here are not much, if any, greater than at Edinburgh, where two men (one by day, the other by night) are employed to distribute the sewage over 400 acres, the principal crop being grass. On a field formerly barren waste, the first crop of grass is gathered in the spring before vegetation has been started on neighboring ground; and the owner now receives a rental of \$125 to \$150 an acre. The irrigation system for disposing of the sewage of Paris began in 1868 on less than one acre of barren land. By 1882 this field of Gennevilliers had extended to 1,275 acres, devoted to sewage irrigation; and at present one third of the sewage of Paris, amounting to 34,000,000 gallons daily, is thus disposed of, while the rental of this land is five times as much as that of neighboring land not thus treated. In consequence of this enhanced value, the government of the city has determined not to extend the system for the benefit of private owners, but has obtained a lease of other land at the rate of \$9 50 annually per acre, with the privilege of purchase at \$320 an acre.

In 1872 the German government entered on a plan of irrigation for disposing of the sewage of Berlin, which is all utilized in this way. In a sanitary point of view the city has gained by the abolition of cess-pools, and the city is said to realize a net revenue of from 1 to 2½ per cent above the fixed charges of interest on cost and operating expenses.

The sewage farm of Croydon, England, now in operation about thirty years, has increased in assessed value from £1 to £9 an acre. At Lemington, a town of 26,000 inhabitants, it is necessary to lift the sewage 132 feet before applying it to the land, and Lord Warwick pays the town \$2,250 annually for delivering it on his land. The sewage farm at Pullman, Ill., produces cabbage, celery, and onions, and the Superintendent reported that it paid over 6 per cent profit in 1883 on the invested amount (\$80,000).

Analysis of water from the subsoil of the plain of Gennevilliers showed that it is entirely free from the properties of sewage, and quite suitable for drinking. As long as the soil is not water-logged by the excess of water, no deleterious effects upon the health of the inhabitants need be feared. On the contrary, the death-rate of Croydon has diminished since the sewage farm was established, and its productiveness has increased five-fold. In the "Sanitary Record" the death-rate of Croydon is quoted at only 11.79, showing it to be the lowest of any town or city in England.

It is alleged that sewage-farming is practicable only for towns of moderate population, owing to the high price of lands contiguous to large cities. The answer is, Paris has adopted this plan, which already disposes of one third of its sewage; Berlin uses it exclusively; Florence, Milan, and Madrid have sewage farms; Edinburgh has practiced the method for two hundred years; Birmingham thus utilizes the sewage of its 650,000 inhabitants. Including small towns, this system has been adopted by two hundred centers of population in England.

In judging this question upon its merits, we must look beyond financial results. It is more than half a sanitary matter. As long ago as 1876 the Legislature of California recognized this fact, and prohibited the pollution of streams by depositing therein dead animals or offal of any kind. It is needless to add that this law has not been strictly enforced. Even where it is practicable to discharge the sewage of cities into tide water, the trouble is not obviated, for in time the deposit of solid matters is sure to obstruct navigation, and generally the mixture of sewage with salt water becomes extremely offensive, unless immensely diluted. It must be remembered that cities often find it expensive to dispose of sewage either in running or tidal waters without creating a nuisance, while a well-regulated sewage-farm is entirely free from such objection.

The real difficulty in sewage irrigation, as in other public works, is in administration. If any way could be devised for managing public business by the same methods of economy that are employed in private affairs, the trouble would vanish.

The indispensable condition of sanitary and financial success is to divorce the administration of the system from party politics. Experience in foreign countries has demonstrated that the value and productiveness of lands thus irrigated are immensely increased, without the use of other fertilizers; and here, where farmers and gardeners are glad to pay a fair and remunerative price for plain water, there can be no economic difficulty in organizing a company and using sewage free of cost for its own lands. The only apprehension would be that the company would ask and obtain undue advantages in its franchise, in the shape of a public bonus or other favorable terms to the detriment of private interests.

CONTAGIOUS DISEASES, AND THEIR SUPPRESSION BY LEGAL MEASURES.

By GEO. CHILDS-MACDONALD, M.D., of Sausalito, F.R.C.S. (Eng.), M.R.C.S. (Eng.), Late
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The title of this paper I admit you will find somewhat misleading, for under it I intend wholly and solely dealing with syphilis and the legal measures which could and ought to be enforced for its extermination. The disease, as we all know, is the most frequent of human maladies, secret, but not the less widespread in its influences, therefore worthy of our serious consideration; nay, it is our duty as guardians of health to forcibly call the attention of the legislators of this and other countries to its baneful issues, not only acting as an individual, but as a race, degenerator.

Syphilis until lately was believed to have appeared during the year 1495, after Columbus' second voyage, and to the New World has been credited the doubtful honor of its nativity. This we now acknowledge to be an error: the writings of Cazenave, Follin, and Lancereau, containing quotations from ancient authors, can but force us to the belief that the disease is of great antiquity. The writings of the Jewish Bible do not give any definite description, alluding as they do to venereal diseases in a general way; but a Sanscrit treatise on medicine, entitled the "Ayurvedas of Sucreutas," written about 400 A. D., and translated into Latin by Dr. Hessler, gives a fairly full and definite account, for he speaks of primary sores, mentioning further several diseases which follow, such as skin eruptions, ulcers, ophthalmia; he also states the eruptions are contagious, heritable, and propagated by cotius. Klein, in a later treatise, 1795, says that the Malabar physicians as early as the tenth century described not only syphilis, but cured it by mercury. Hippocrates describes some affections which we now ascribe to the disease, while many of the old medical works still remaining of the early Greek and Latin physicians, speak of local ulcerations and their sequelæ, which we now speak of as its constitutional manifestations. Celsus, Arctæus, and Galen, in their writings give evidence of their familiarity with and the generality of the disease. The latter mentions its bone affections under the name of osteocopic pain. Oribasis describes moist and dry ulcers of the pudenda and anus. Marcellius Empiricus speaks of ulcers of the tibia, which eat their way inward. The erotic poems of Martial, Juvenal, and others furnish abundant description of venereal diseases of the genitals, face, mouth, and groin. They mention that these may be communicated by kissing, as well as by cotius. The introduction of the worship of Lingam from India, and Priapus into Greece, conclusively shows the ancients were aware cotius with infected persons communicated disease, while in the myths of Lingam it is related that a scourge, originating in Civa, was propagated henceforth by transmission from women to men. Seeking evidence farther east, we find the Chinese Emperor Ho-ang-ti, who reigned 2637 B. C., caused the medical writings

of the nation to be collected and formed into a systematic treatise. Here gonorrhea is described, and in later editions there are clear accounts of chancre, phimosis, bubo, ulcerations of the tonsil, anal sores, ulcers of nose and soft palate, and coppery eruptions of the skin, cured by mercury. Here even remedies are mentioned for mercuric pyalism. So much for ancient history.

There is in the national library of Paris a treatise bearing the date of the ninth century which gives a full account of the disease, from which date it is easy to trace it by the works of successive European authors to the present day. As I before said, syphilis is the most widely and generally spread of all diseases; no country or nation is entirely free from it. In the interior of Morocco, according to recent travelers, whole tribes are affected in its most loathsome and terrible forms. In Russia, according to Dr. Podolinski, it is the principal disease of that country; in some of the villages one third of the inhabitants are contaminated. In Tavoslawka, of 120 families 30 certainly were syphilitics, and only 64 of which were known to be healthy. Here its influence on mortality is excessive, hardly any one reaching the age of 60, while the death-rate of diseased families is half as great again as that of the remaining population. In Finland the disease is prevalent. Hjelt states that the national habits are conducive to its propagation, many families living in one house, using cloths, bedding, cups, towels, spoons, and pipes in common. The operation of cupping is universal, there being regular cuppers or bleeders. These people are frequently the vehicle by which the disease is transmitted, just as at times careless dentists are among us. In the village of Hakola, a female cupper, herself syphilitic, inoculated two hundred people with her cupping apparatus. Travelers among savage nations report the disease to have been introduced and spread with alarming rapidity and great virulence wherever Europeans have reached. The native Australian races are practically exterminated by it. There is no question as to its wide distribution among the races of India, China, Japan, Europe, and America. In Guy's Hospital, London, 43 per cent of the whole of the out-patients suffered from syphilis in some form; Hospital for diseases of the skin, 10 per cent; Hospital for diseases of the throat, 15 per cent; Moorefield Hospital for diseases of the eye, 20 per cent.

Here we must bear in mind that in London there are special hospitals for this disease, which would be a factor in reducing the percentage of general hospitals. These figures may be taken as a fair average for any large city such as Edinburgh, Manchester, Leeds, New York, Boston, Philadelphia, San Francisco, etc.; while my experience as a medical man, practicing in California, would lead me to believe that the State population makes no exception to the general rule, especially if we look to the thriving condition of the numerous quacks who make a specialty of these diseases. Now, in advocating prophylaxis, I do *not* want you to understand that I am doing so in the interest of those who deliberately expose themselves to contagion. My plea is for those innocent ones who are the victims of cruel circumstances, and for the material welfare of ourselves as a nation. There are admittedly many ways of inoculation, such as kissing an infected person, using the same fork, spoon, knife, or pipe, sleeping in the same sheets on which a diseased person has previously lain, dental and surgical instruments, vaccination, suckling a syphilitic child, or a

syphilized wet nurse suckling a healthy child. Physicians frequently become inoculated by examining diseased patients; rag pickers of a necessity are liable to infection, and so on through many and various conditions of life; but my plea becomes stronger when we consider the position of the young wife, the expectant mother, and her unborn child. It is easy for us to say that no man should marry who has acquired the disease; but how futile our warnings are all present too well know. We are now advocating the segregation of phthisical patients because of the tubercle bacillus. What of the bacillus of syphilis? Phthisis has slain its thousands, but syphilis its tens of thousands. The bacillus of phthisis only attacks the inherently weak, those predisposed to its action. Thus tuberculosis becomes a factor in natural selections by which these weaklings are removed and prevented from propagating their infirmities. It is therefore, so to speak, a regenerator of the race, while syphilis, attacking strong and weak alike, has no such selective properties, but its tendency is toward human degeneration, physically, mentally, and morally, of the worst kind. It spares, as we know, no part of the human frame—the muscles, bones, joints, brain, spinal cord, glands, skin, mucous membrane, hair, nails, stomach, bowels, liver, kidneys, spleen, organs of generation, the senses of hearing, sight, feeling, taste, smell, and speech; nay, mind and intelligence itself are claimed as victims to this vampire, which walks and stalks and lives, and has its being among us, and it becomes the duty of all honest, broad-minded, intelligent men to throw aside a false modesty in this matter, and stamp out the pest we, as a race, have been harboring so many years; to assist in obtaining legal enactments necessary, which may be divided into two classes: laws which are applicable to the community at large, and those which apply to the family and individual alone.

Under the first heading, concerning the public health, comprises accommodation for treatment of the infected and provision for the restriction against the spread of the disease. The old cry of unwarrantable interference with the liberty of the person can find no ground here, for we have already restrictive laws for certain diseases, as smallpox, scarlet and typhus fevers, cholera, etc., and general quarantine for our ports, to say nothing of insane asylums, inebriate institutions, anti-cigarette and prohibitory liquor laws. By neglecting to provide for the regular treatment of syphilis the State encourages quacks and ignorant charlatans, whose sole object is to empty the pockets of the patient, without regard to the treatment of the disease or to the prevention of its diffusion. Now, it is universally admitted that one of the primary factors in its propagation is by the women of ill-fame, a class which has existed from time immemorial, and which does and will continue for all time, so long as human nature is as it is. It is estimated on good authority that 40 per cent of these women suffer from some form of venereal disease. It therefore becomes our duty, as we are unable to prevent it, to license, localize, and control this social evil. For this end hospitals specially for this disease should be maintained at the expense of the State, in which these people shall be received and kept until they become non-infectious. Every woman known to be a person of ill-fame should be duly licensed; she should be compelled to attend twice a week at some municipal building set aside for this purpose, where she shall undergo a proper medical examination by a competent physician appointed by the State, who shall enter her name, age, address, and

description in a book as a means of identification, and indorse her license, such indorsement to hold good until the next examination day. Should she be found diseased, she shall be sent under arrest to the nearest State hospital, and should she not attend on the proper examination days she shall be subject to arrest, fine, and imprisonment. That no male shall marry, or obtain a marriage license, or enter into a contract marriage until he shall produce before the Recorder a certificate from a duly qualified physician who has previously been appointed to grant such certificates, stating that he is non-contagious in a venereal sense, accompanied by an affidavit that he has not contracted syphilis for three years past. That in all cases a woman who has been a prostitute shall produce a similar certificate, with the additional statement that she be capable of bearing healthy children. Should it be proved that any person by direct contact, or by his or her negligence, has caused another to be infected with syphilis, such person shall be liable to not less than seven nor more than twenty-one years' imprisonment. That every duly qualified medical practitioner shall keep a record of all cases treated by him, such book to be issued and to be under the control of the State. That any person not a duly qualified and registered physician, who shall treat any syphilitic, shall be liable to fine and imprisonment. That all wet nurses shall, before entering on their duties, obtain a certificate of health from one of the certifying physicians. That all vaccination shall be done solely by calf lymph. That all tramps and vagrants shall undergo a medical examination by one of the certifying physicians, and if found diseased shall be sent under arrest to one of the special hospitals, where they shall remain until sufficiently well to go at large.

In conclusion, I add that partial laws have been in force in Europe, but as they only reach the poorer classes and leave out the rich and influential, their success has consequently not been marked. The system I advocate would bring all kinds and conditions of men under the law.

These few remarks which I have put before you, inadequately I know, are but a nucleus, and demand your serious consideration, both as the guardians of the public health and as human beings. Knowing what we do, it becomes our duty, morally and socially, to move in this matter. The immortal bard might have meant syphilitic poison instead of hemlock when he made Hamlet's father say:

"The leprous distilment, whose effect
Holds such an enmity with blood of man
That swift as quicksilver it courses through
The natural gates and alleys of the body,
And with a sudden vigor it does posset
And curd, like eager droppings into milk,
The thin and wholesome blood: so did it mine;
And a most instant tetter bark'd about,
Most lazar-like, with vile and loathsome crust,
All my smooth body.

* * * * *
Oh, horrible! Oh, horrible! most horrible!"

THE ULTIMATE DISPOSAL OF SEWAGE.

By J. H. STALLARD, M.D., of San Francisco.

Two years ago I delivered a lecture on the problem of the sewerage of San Francisco, copies of which are at the disposal of the members of this convention. In that lecture I endeavored to demonstrate that the chief difficulty connected with the safe removal of house drainage was caused by the attempt to remove rainfall in the same sewers. That in summer, when there was absolutely no rainfall for many months, the sides of large empty sewers became the culture plates of dangerous bacteria, and that the emanations from empty sewers are the causes of disease. I endeavored to show that the size of sewers should be accurately adapted to the volume to be conveyed, and that the volume should be made as uniform as possible by the exclusion of rainfall. I maintained that every sewer requires constant flushing by an adequate supply of pure water, a condition quite impossible in large sewers. I pointed out the fact that the proper house sewage of San Francisco is derived during the summer from the Spring Valley water supply, and that no sewage leaves the city which has not been pumped into it. I had neither time nor opportunity for discussing the question of ultimate disposal, and, as nothing has been done, there is still a remote hope that a system may yet be constructed by which the waste removable by water carriage may be reconverted into useful products without danger to the public health.

It is a great misfortune that the disposal of the waste of large cities has fallen into the hands of engineers who have dealt with it almost exclusively from a mechanical point of view. To remove the sewage was the sole object. So long as the sewers were large enough, and their gradients favorable; so long as their outlets were sufficiently removed from human habitations; so long as sewage was put out of sight in a brook, river, or the sea, the problem was considered solved. Had they known and realized the fact that nature has provided a plan by which all dead and effete matters may be safely and speedily brought again within the range of active life, it is possible that their aim would have been to carry out that plan. And it is not one of the least difficulties now encountered that nearly all existing works for the removal of city refuse are positive obstructions to the end desired. Instead of making sewers adapted to the removal of sewage only, they made them to carry rainfall also. Instead of making them small enough to flush and keep sweet and wholesome, they made them large enough to drive a wagon through. They have fouled pure valley streams, and there is scarcely a river, foreshore, or estuary of which complaint has not been made, until to-day the tendency of legislation is to force upon communities the adoption of processes, chemical or mechanical, with the object of preventing the evils which have been created. At present the authorities of San Francisco have been engaged in the inquiry as to the possibility

of turning the sewage into the bay of San Francisco at such times and places as that it shall be carried out to sea. Should the existence of such a current be established, there would still be little proof that the sewage would travel as desired, or that no evil to the foreshores would ensue. There is no known instance of a large city pouring its sewage into the sea without establishing a nuisance. New York is probably the best example. But at Sandy Hook, the bathing town of Bath has been ruined by the refuse which accumulates on its foreshores. In discharging sewage safely into a tidal sea there are some insuperable difficulties. First, it is necessary to hold back the sewage either in large intercepting sewers or reservoirs, the floodgates of which have to be opened at half-ebb tide. During the filling of these reservoirs the foul gases generated on their filthy walls are forced back into the dwellings of the people. Moreover, the outlets have to be built far beyond the shoreline, and are not only costly to make, but difficult to repair. When sewage and sea water are confined together, deposits take place which stop up the outlets, and when sewage is projected into sea water, it rises to the surface, being both lighter and warmer, and it thus often refuses to follow the current which was expected to carry it away.

A remarkable proof of the impossibility of safely turning sewage into the open sea was examined by me when a Sanitary Commissioner of the *Lancet*, in the bathing town of Brighton, built upon the coast of St. George's Channel. There is here a high daily tide, running east and west along the shore with great velocity. A huge iron pipe was laid at the bottom of the sea, nearly one mile in length. Through this the sewage, which accumulated in a long intercepting sewer, was discharged twice a day at half-ebb tide. The discharge could be plainly seen from the parade. It rose like a fountain of black ink, and floated away in a black stream, which could be seen for several miles. Solid floating refuse came toward the beach, which became so offensive as to threaten the ruin of the town for bathing purposes. The method of discharge had to be done away with, and a sewer several miles long was made to convey the sewage to another place.

The sewage of London is discharged into the Thames at half tide. It is carried down the river 14 miles, and yet effete matters from the sewers may be found 15 miles above the outlet of the sewers. The sewage of Southampton was delivered in the Southampton estuary; the shores became so foul that other measures had to be adopted. But, it being granted, for the sake of argument, that the sewage of San Francisco could be carried out through the Golden Gate, is there still proof that it would go to sea? When the waters of the bay of San Francisco were fouled by the debris from hydraulic mines, it was possible to trace the course taken by the stream emerging from the Golden Gate. It passed up north, hugging the shore and the beach, which became reddened by the deposit brought down from the mines. It seems reasonable to suppose that instead of being carried out to sea, the foul matters of San Francisco sewage would float onto the same foreshores, and that they would ere long become a nuisance. The objections to disposing of the sewage in the bay are—

1. The cost and difficulty of delivering the contents of the sewers in the proper current.
2. The fundamental sanitary objection to tidal outlets.
3. The cost of the necessary reservoirs or intercepting sewers.

4. The impossibility of obtaining a firm foundation for them.
5. The sewage will rise to the surface and be liable to float away in unsuitable directions.
6. There is no certainty, therefore, that the city foreshores will not be fouled.
7. It is still more probable that foul deposits will occur on the northern beach of the Golden Gate.
8. And if not there, on the shores of Marin County, outside of the Heads.
9. The conditions for the destruction of effete matters by bacteria, and the restoration of these waste matters to the domain of active life, are not fulfilled.

In order to settle the question of the ultimate disposal of sewage, it is necessary to consider the process by which alone effete matters are effectually destroyed without danger and restored to usefulness and the purposes of life. It is now settled beyond dispute that this is accomplished by the growth, life, and death of the *Bacterium termo*, which grows, under favorable conditions, with such rapidity that the Pacific Ocean might be filled with it in less than one week. By the action of this bacterium, sewage may be converted into food for plants with an entire absence of offense to the sense of smell or of danger to the public health.

The bacterium grows under a wide range of temperature, but it requires, before all things, a large supply of oxygen, and the problem of ultimate disposal is to be solved only by arrangements which will secure this object. This can only be accomplished by passing sewage over stones or through porous sand or soil, and if this be effectual the process of bacterial growth begins at once and continues until the last vestige of organic matter has been made fit for plant food. As Waring says, the art of sewage disposal consists in suitably subjecting the matters with which we have to deal to the action of bacteria so quickly and effectively as to avoid offensive and dangerous conditions. Mr. Bailey Denton has constructed artificial filtration beds, which purified sewage to the extent of 30,000 gallons per acre, the effluent water being purer than ordinary spring water. The Massachusetts Board of Health has shown that 25,000 gallons of sewage may be purified by one acre of fine sand in a day, even in cold weather, and that the effluent water contained less nitrogenous organic matter than the waters of Lake Winipiseogee. I have, myself, examined the effluent water of the sewage farm at Aldershot. The soil was a hungry sterile sand, and the drains were 4½ feet deep. The sewage of 20,000 soldiers was utilized on 80 acres, and the effluent water was bright, clear, and devoid of organic matter. The purification of the sewage is not due to the mechanical retention of foul matters in the soil, but to the action of bacteria, which are found to be most abundant near the surface, and which disappear at the depth of from 4 to 6 feet. If germicides are added to the sewage the purification stops and the effluent water becomes foul and stinking. At Wayne, Penn., the sewage is received on an area of broken stone 8 inches deep, 75 feet wide, and 90 feet long. The flow is 10,000 gallons an hour. The area of irrigation is 4 acres, and it is capable of clearing 200,000 gallons every day, one third of the area being used each day. The effluent water is perfectly pure and frequently drunk by visitors. The coarse matters are detained amongst the stones, and the partially purified

sewage is distributed on a prepared soil. These fields of broken stone are used every third day, and then go dry.

The capacity of properly prepared soil for purifying sewage has not as yet been reached. It is not destroyed by use, and may be largely increased. One thing of cardinal importance has to be secured, viz., absolute porosity. There must be no stagnation, no water-logging. There must be secured a proper outlet for the sewage after filtering through the soil. The nature of the soil seems to be of small account so long as under-drainage is maintained. At Crewe, in England, the sewage irrigation farm is a strong clay, and yet 4,000 gallons of sewage are daily applied to each acre without any bad effects. From this it seems certain that, in the words of Richardson, "all sewage must be conveyed to the land which hints for it—the land which alone disarms it of its dangers—the land which becomes exhausted and infertile if its demands for organic refuse are not naturally supplied." This conclusion has been indorsed by very high authority. The Royal English Commission reported that the *right* way to dispose of town sewage is to apply it continuously to land. The Local Government Board (the chief sanitary authority in England) say that sewage can best and most cheaply be disposed of by the process of land irrigation. The Society of Arts of London say that irrigation is the best method of disposal. The report of the French savants states that the most economical, practical, and efficacious means of sewage disposal is the irrigation of a sufficiently permeable soil, and they report that the plain of Gennevilliers attests conclusively not only that luxuriant vegetation results, but establishes harmlessness in respect to health, as well as perfect purification of the water. At Gennevilliers the sewage of 400 persons is applied daily to every acre.

The Corporation of Glasgow reported that the evils of crude sewage will make themselves felt when poured into a running stream, into a tidal river, or into the open sea. The Italian Commission of Turin declare that irrigation is the only efficacious method of sewage disposal. In fact, every public inquiry for thirty years past has concluded that the only safe means of disposal is by land irrigation. Now, the capacity of various soils varies greatly, but is mainly determined by their permanent porosity and efficient under-drainage. Percolation must be constant. Some soils will purify 100,000 gallons of sewage per acre per day; but the cultivation must be good, and the under-drains must be six feet deep. Under such conditions the effluent water will be bright, inodorous, and nearly colorless. The difficulties of efficient sewage irrigation are greatly increased by rainfall, which, if admitted to the sewers, adds to the bulk, and if received on the farm interferes with the absorption and percolation of the sewage. The following table shows the condition of sewage irrigation in England. But it must be remembered that, as compared with California, the English rainfall is large and continuous, and that the great value of land near large towns is an obstacle to its appropriation for irrigation purposes:

	Population.	Aeres.	Sewage per Acre.
Bedford	4,000	130	8,000
Birmingham	620,000	1,220	13,000
Blackburn	116,000	700	5,000
Burton-on-Trent	46,000	430	10,000
Crewe	31,000	*255	4,000
Doncaster	24,000	270	} 2,000 {to 3,000
Edinburgh	270,000	333	33,000
Kidderminster	30,000	192	9,000
Norwich	95,000	500	8,000
Nottingham	240,000	650	15,000
Warwick	12,000	134	4,000
Beddington	73,000	420	} 8,000 {to 30,000
Totals	1,357,000	5,234	119,000

* Strong clay.

260 persons to each acre; 10,000 gallons of sewage per acre daily.

Although it is not desirable that the disposal of sewage by irrigation should be determined on the basis of profit and loss, it may, nevertheless, be demonstrated that in no case need the loss be great, whilst the possibilities of profit are considerable, and in California the question of climate assumes an aspect of supreme importance. The advantages of irrigation in California must of necessity be much greater than in England, where the occurrence of land drought is only exceptional. In California much of the land is sterile during half the year, and for even longer, should the rainfall fail. With suitable irrigation, even of clear mountain water, the produce of California may easily be trebled, and with sewage irrigation it is difficult to realize what the produce would amount to. At Aldershot the land employed for irrigation was purchased by the Government for 12 cents an acre. It produced nothing but a scrub heather, not more than a few inches high. After seven years of irrigation I saw again this farm, which was rented out to market gardeners at the annual rate of \$100 per acre. In 1865, Mr. Hope bought a farm of 127 acres, about 30 miles from London, for \$400 an acre, and he leased the sewage of the neighboring county town, having about 6,000 inhabitants. At the time of Mr. Hope's purchase the labor of the farm was done by a master farmer, his two sons, and two horses. The annual rental was \$10 per acre. Mr. Hope was required to pump the sewage as fast as it came from the town. He leveled the land, made irrigation gutters, and put in under-drains. I saw this farm five years afterwards, when there were employed upon it 25 horses, 30 men, besides a small army of women and children. The cost of cultivation was \$175 an acre, and the value of the produce was more than double.

Let us consider this question with special reference to San Francisco. Allowing for reasonable waste from evaporation and absorption, the water supplied by the Spring Valley company in winter may be taken as a guide to estimate the bulk of sewage. That supply in winter, which represents the house consumption, is said to be 18,000,000 gallons daily, of which it is possible that 15,000,000 or 16,000,000 would reach the sewers after domestic use. With proper arrangements on a well-managed farm, 20,000 gallons may be readily disposed of on each acre the year through, and much more during the dry season. At this rate there would be

required an area of 800 acres. Let it be assumed that this farm so far from being a nuisance would be a positive benefit to the locality, as is the case at Gennevilliers and other places, and it may be certain that at least 1,000 acres could be found within a reasonable distance of the city, say within 20 miles. If we attempt to estimate the volume of sewage by the population we may reasonably calculate that one acre of land may be safely made to receive the sewage of 500 persons, or say 700 acres for 350,000 people. In order to carry sewage 20 miles a fall of 50 feet will be required, and if proper intercepting sewers are constructed, not less than two thirds of the sewage of San Francisco could be delivered 20 miles away from the city without pumping, and the remainder would be a bagatelle, for we must not forget that the total sewage of San Francisco may be conveyed away in conduits no larger than those used to bring the water into the city. Between South San Francisco and Redwood there are many thousands of acres which might be made suitable for sewage irrigation; even below high-water mark, land that is now entirely useless might be reclaimed from the bay and its foreshores.

MODERN CREMATION AS A MEANS FOR THE DISPOSAL OF THE DEAD.

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Mr. President and members of the Second Annual Sanitary Convention of the State of California:

Few subjects are of such paramount importance to the physician, to the sanitarian, and to him who takes any interest in the public weal; indeed to the individual, to communities, to the State, and to the world, as modern cremation. At the outset this may seem to a person who has given it no thought, a bold, a very bold, assertion. A little study and some reflection will convince even the most doubting Thomas that it is and will continue to be one of the vital sanitary questions of the present and of the near future, and that its economic, utilitarian, and other aspects demand more than a passing notice. It must be faced as inevitably as death itself. What shall we do with our dead? Bury them or cremate them? That is the problem to be solved.

To be sure, other modes for the disposal of the dead have been had recourse to in different parts of the world and at various periods. In Judea the dead were put away in sepulchres. The Egyptians embalmed them. The Greeks at first buried their dead, but later incinerated them, denying incineration to unteethed children, suicides, and persons struck by lightning. The Romans followed in the footsteps of the Greeks, and cremated their dead from the close of the republic to the end of the fourth century of our era. These are not all the means for the disposal of the dead followed in times past, but are the ones most used. With the exception of earth-burial they need not detain us.

The sanitary reasons for discontinuing earth-burial and substituting modern cremation for it stand out so prominently that it does not require much of an effort to make them patent to an audience constituted, as this one is, of those conversant with public hygiene. Even one who knows nothing about the matter will be struck by the fact of so many sanitary regulations and legal enactments which are in existence and are continually being made concerning the starting, maintenance, and management of cemeteries. If these places were so innocuous to the public health, so innocent of disease and death-dealing properties, and so free from all danger to the sanitary welfare of the State, why should the statute books be incumbered with so many laws which try to minimize, if not to avert, the danger resulting from them? Why not so many laws, if any, in case of other subjects which are, confessedly, not dangerous to health and life? It must be admitted that the presence of any burial ground is identical in its effects upon health and longevity as is that of any other accumulation of putrefying animal matter. That eminent English surgeon of world-wide reputation, Sir Henry Thompson,

tersely and truly says that "no dead body is ever placed in the soil without polluting the earth, the air, and the water above and about it."

In proportion as burial grounds are overcrowded and filled up, are dangerous effluvia given off, and as a consequence thereof are the surrounding air, earth, and water contaminated. Brick graves, leaden shells, oak coffins, vaults, and the like, "retard decomposition and befoul natural decay," as Mr. Seymour Haden very correctly states, and, if anything, only make matters worse.

In 1884, cholera was prevalent in Spain, and thence spread to Italy and France. It first appeared in Spain after the earthquakes at Granada. It was demonstrated that it originated from the emanations given off from the bodies of those killed in the earthquakes and buried within the city limits.

In 1785 the old cemeteries of Paris became so detrimental and dangerous to health that new ones were opened. These in their turn soon became unsanitary. We learn from the archives of the French Academy of Medicine that the districts near Mount Parnasse, Père-la-Chaise, and other cemeteries were very unhealthy, many of the inhabitants of those districts suffering and dying from zymotic and other diseases due to the nearness of the cemeteries. We need not cross the ocean for an exemplification of that truth; we see it right here on this side of the Atlantic. The township of Newtown, Long Island, New York, which is surrounded by cemeteries containing the decaying remains of 1,250,000 human bodies, has the highest death-rate in the State of New York. The same condition of affairs exists in the neighborhood of all large cemeteries in a greater or less degree. Of Philadelphia, it may be said that it has the highest annual death-rate of any city in the Union, which is unquestionably accounted for by the Schuylkill and Delaware Rivers being polluted by seven large cemeteries which are drained into them, and thereby infect the Fairmount waterworks, from which the city receives its water supply. Dr. Franklin Gauntt, of Burlington, New Jersey, gives it as his opinion that "the Schuylkill River, that meanders through the Fairmount Park, is polluted by seepage from the cemeteries near its banks." The same physician further says that "these little drops of water squeezed by 'Father Time' from the dead are loaded with death for the living who drink it. In fact, I have heard professional men in Philadelphia say that when you drink Schuylkill water you are sampling your grandfather. It is commonly stated that in certain analyses made of this water traces of the oil of cedar have been found, and it came from the coffins and cedar cases of those buried in Laurel Hill Cemetery." "That the dead do kill the living," says Dr. W. H. Curtis, "is only too true, and that cholera, yellow fever, and the whole list of zymotic and infectious diseases are capable of being transmitted through the contamination of air and water supplies, is no more difficult of demonstration than it is to prove the ability of sewer gas or sewer water to propagate disease."

Disturbing unused burial grounds or disinterring buried human remains which were supposed to be no menace to health and life, often has been the cause of disease and death. Dr. J. Lewis Smith, of New York, in a paper read March 12, 1891, before the New York Academy of Medicine, tells of a case of a grave-digger who exhumed the remains of a human being who had died of diphtheria and been buried twenty-three years, and who (the grave-digger) succumbed to it himself. According to the researches of the French government into the cause

of the plague in Egypt in 1823, it was shown that it was owing to the digging up of graves in disused cemeteries at Kelioub, near Cairo. The latter city suffered severely, and Kelioub lost 2,000 of its inhabitants—a very large percentage. Professor Bianchi believes that the plague which occurred at Modena in 1828 was caused by disturbing the graves where those who died of that malady had been buried over three hundred years. Mr. Cooper tells us how the malignancy of the cholera in 1854, in London, was aggravated by the digging of sewers in the soil where the victims of the plague of 1665 were buried. When the parish church at Winchinghampton was remodeled and some of the earth from the cemetery was sold for manure, it resulted in decimating the population.

It would appear that time does not destroy the vitality of germs. Grain entombed with Egyptian mummies for forty centuries has been planted and sprouted. Dr. Fred Peterson, in an article on cremation, which appeared in the issue of April, 1881, of the "Buffalo Medical and Surgical Journal," very pointedly asks: "By what authority, then, can we affirm that life departs from disease germs by inhumation? How dare we preserve in the South vast depots of yellow fever fomites, coffers of Asiatic cholera, and every year accumulate and treasure up small-pox, scarlet fever, whooping-cough, diphtheria, and measles?"

Within the last decade bacteriology has taught us that disease germs, or bacteria, may be frozen or exposed to a very high temperature and still retain their vitality and their ability to propagate their species. Bolton saw certain water bacteria thrive in an ice chest at 6° C., and other observers watched them increase at a freezing temperature. Low temperatures do not destroy all varieties or species of bacteria. Frisch, in 1877, subjected micrococci to a temperature of -87° C., obtained by the evaporation of liquid carbonic acid gas, and that did not prevent them from multiplying again when the temperature was increased. The experiments of Sternberg showed that the staphylococcus pyogenes aureus withstood a freezing temperature for 66 days, a fluorescent bacillus from Hudson River ice for 77 days, and the bacillus of typhoid fever for 103 days. The same observer gives, on page 147 of his manual on bacteriology (by the way, one of the best works on the subject in the English language), the thermal death-point of various bacteria. Among others that of the—

<i>Spirillum cholera asiaticæ</i> at	52° C., or 125.6° F.
<i>Bacillus typho-abdominalis</i>	50° C., or 122° F.
<i>Bacillus pneumoniæ</i> (Friedlander's)	56° C., or 132.8° F.
<i>Staphylococcus pyogenes aureus</i>	58° C., or 136.4° F.
<i>Staphylococcus pyogenes citreus</i>	62° C., or 143.6° F.
<i>Staphylococcus pyogenes albus</i>	62° C., or 143.6° F.
<i>Sarcina lute</i>	64° C., or 147.2° F.

All these, except the spirillum cholera asiaticæ, were exposed to the elevated temperature for ten minutes. He also states that certain bacteria are not only not destroyed, but are able to multiply at 65° to 70° C. Thill, in 1881, grew a bacillus found in the Seine at 69° to 70° C. Globig found soil bacteria growing from 60° to 70° C. Voelsch claims that the tubercle bacillus of sputum was not destroyed by 100° C. From these statements it appears that all bacteria are not affected by the ordinary temperatures, and it would seem, according to Globig, that bacteria found in the soil are very tenacious of life.

Whether the soil bacteria are dangerous or not to health, is perhaps yet an open question. But may not other bacteria which are dangerous

to health find lodgment, thrive, and withstand very low and very high temperatures therein, and that, too, in graveyards? Pasteur found the bacillus of anthrax in the soil in which had been buried animals that had died from it, and sheep that were browsing on such land were affected by and succumbed to anthrax.

"The horribly offensive gases which are given off from dead animals in a state of putrefaction appear to be due to certain large anaërobic bacilli which are found in such material, and which have not yet been thoroughly studied, owing to the difficulty of cultivating them in artificial media; among them is a large bacillus with round ends, which forms an oval spore at one extremity of the rather long rod," says Dr. Sternberg. This micro-organism he terms *bacillus cadaveris grandis*.

Numerous other putrefactive bacilli have been studied, among others the *proteus vulgaris*, *proteus mirabilis*, and the *proteus zenkeri* of Hausen. These species of *proteus* produce a chemical poison, which, when injected into small animals, gives rise to all the symptoms of putrid intoxication. These bacilli (the *bacillus cadaveris grandis* and other anaërobic bacilli found in putrefying masses) are more or less pathogenic. Other anaërobic bacilli exist which grow in the absence of oxygen in the interior of decomposing animal material, while aërobic saprophytes may grow and increase on the surface of decaying animal material with which the air comes in contact. According to one of Koch's postulates, which has been proven to be true over and over again, we know that culture liquids of anthrax and other diseases injected will cause the disease and death. Bacteria need not be injected to do this, but deleterious and even lethal effects are caused by their inhalation by the way of the respiratory organs. This occurs in what is known in England under the designation of "wool-sorter's disease," where men handle and sort wool clipped from animals that had anthrax, and whose wool contains anthrax bacilli. This disease, which killed the victims in some instances, was contracted in this wise. This mode of infection is fraught with danger.

What is there to prevent the germs of disease being wafted from the germ-laden atmosphere of a cemetery over a whole city, if the city is located in the direction of the wind from such a death-dealing place? It is impossible to foretell when an epidemic may arise from such a cause, as neither any fixed time nor any ordinary temperature destroys the activity of these germs, as we have seen. Has not the same thing occurred in Burlington, Iowa? Rauch, in his "Intramural Interments in Populous Cities," relates how that took place at the last-named city in 1850. A very important matter for San Francisco, where the winds, which blow for a greater part of the year, and more steadily in one direction than in most places, become contaminated by passing over some of the most crowded and most popular cemeteries before they reach it. That city should be doubly careful about what concerns burial places, as it possesses a danger which our Eastern and European cities do not, and that is a Chinese population. These people may be afflicted with every disease, be buried, and what is more, their remains be disinterred, after a longer or shorter period, for shipment to China, as is their custom. This is still further emphasized by figures from the health reports of San Francisco for the fiscal year ending June 30, 1893 (which I am enabled to quote, through the kindness of Dr. James W. Keeney, the affable and competent Health Officer of San Francisco), which show the

death-rate of these people to be higher than that of the other races—23 per cent per 1,000 Mongolians, against 18 per cent per 1,000 of the other races. From the same source it also appears that there were 86 Chinese disinterments during that period. If we remember that they are often, if not nearly always, attended by irregular practitioners of their own race and nationality, who do not diagnosticate the disease properly, and further, even if cognizant of its nature, the cases are not always reported to the authorities, we can well conceive what a menace to life and health that condition of affairs engenders.

Without giving more facts and data concerning the sanitary side of the question, I may reiterate, as proven, this statement as covering the ground, and which occurs in my article entitled "Earth-burial and Cremation, considered from a Sanitary Standpoint": "Air, earth, and water are so poisoned by the products of decomposition emanating from buried remains of persons, many of whom labored under all forms of ills, that they are capable of harboring, generating, and originating every form of disease, and, secondarily, may be the occult means of undermining the hygienic conditions of whole communities, that earth-burial should be discountenanced and forbidden by law as being prejudicial to the public health."

Latterly it has been contended that there need be no more danger from the proximity of cemeteries to the dwellings of the living, modern rapid means of communication making it possible to remove the cemeteries so far away that they cannot affect the sanitary state of the people. Supposing that you remove the cemeteries a distance from the cities, what right have you to plant such a menace to life and health in the midst of a rural population? Will it do away with the danger, as far as those are concerned whose duties and vocations bring them and keep them there during a longer or shorter period of time? Will it not attract a population whose duties compel them to pass part of their time in these places, and allure others who gain a livelihood from the first named? Finally, will it not, in time, be the center of a town? It may even encroach upon the city limits which it was never expected to touch. It does not solve the question. Already in this young city (San Francisco) burial grounds have to be laid out in the immediate vicinity, the old ones being overcrowded. In the no distant future they also will be in the center of a large population, and will have to be closed up, and probably removed.

In spite of the foregoing facts, and notwithstanding that numerous others, aye, that the experience of the past and the whole medical literature may be drawn upon in substantiation of them, inhumation is still practiced. Old cemeteries are being overcrowded and filled up, and new ones continually opened. Thousands upon thousands of acres of land, which might be made productive, are given over to the dead, whom they do not benefit, but, absolutely, injure the living, considered from a sanitary, economic, and utilitarian standpoint. This is no overdrawn picture seen through the befogged and biased spectacles of the enthusiast.

About 4,000 acres of land in the immediate vicinity of New York and Brooklyn, N. Y., which are used for cemetery purposes, and are exempt from taxation, may be cited as one of the many illustrations which may be given. Within their borders thousands of bodies are interred annually. A high sanitary authority places the limit of the number of bodies to be buried in an acre of ground at 1,000.

The population of New York and Brooklyn, New York, in 1890, was 2,485,177, and the combined average-death-rate in both cities, 23.90, giving us 59,930 deaths in the two places. What an amount of land must be appropriated for the use of the dead in the future! Cobb, in his excellent book on "Earth-burial and Cremation," voices a growing sentiment in speaking of Newtown, Long Island, New York, which is environed by cemeteries, when he says: "Against the intolerable evils we have mentioned," having reference to the utilization of land for burial purposes, and at the same time to its injuring the living, "the authorities of Newtown have for years contended in vain. They see their property injured, health threatened, and hundreds of acres stricken from the tax-roll and dedicated to the occupancy of the stranger dead."

This represents the pecuniary loss in measure that it causes to communities, but upon families and the individual it bears still harder, viewed from another side. It costs money to live, but it takes more money in proportion to die. The extravagant expenses incurred when a man is laid away to his "eternal rest" (?), as the anti-cremationists would put it, often represent a large percentage of what the deceased used during his lifetime, particularly if he lived in moderate circumstances and did not attain an advanced age. By a false pride, fostered by an erroneous conception of what is due to the departed, coupled with a desire not to be outdone by their neighbors, those who are left behind often really impoverish themselves by having expensive and ostentatious funerals, far beyond their means. The high-priced burial plot, for the cost of which a large part of the whole cemetery was originally bought, and for which amount, at all events, several hundred times its land acreage could be bought right outside of and adjoining the cemetery gates or fence; then the very expensive coffin or casket, which is seen for a few hours, only to be put under the sod to molder away, and other incidental disbursements connected with inhumation, must certainly be placed on the credit side of cremation. This all comes when the family of the deceased are least able to stand it. The bread-winner of the family, perhaps, has been removed; their savings, if there were any, have been eaten up by the necessary expenses of the last illness of their beloved and dear departed one. When they have recuperated from this financial holocaust there comes bankruptcy staring them in the face for a monument to be erected. When they have survived that expenditure a mortgage is put upon their pockets in the shape of payments at short intervals for keeping the plot in order, which lasts as long as they do, if they are able to stand the drain and are too sentimental or afraid to rebel against it.

Such a magnitude has this assumed that societies having for their object the suppression of this evil (for that is the proper appellation for these high expenses often connected with earth-burial) have been formed in various parts of the civilized world. The cost of inhumation rolls up into the hundreds of dollars; that of incineration but to a fraction thereof.

With all this expenditure of money, the remains of the deceased are not secure from body-snatching, a matter of a good deal of moment in the case of illustrious and rich persons. The present generation all remember the stealing of the body of the New York millionaire, A. T. Stewart, from his mausoleum. The trouble taken to avoid such an occurrence in the case of the great Grant, and in that of the lamented

Garfield, are matters of public record. Many will remember how the lonely vigils at Lake View cemetery, near Cleveland, Ohio, where all that is mortal of Garfield is entombed, dethroned the reason of one of the sentinels on duty. With cremation no such possibility exists.

More than all this is the horror of some persons of being buried alive. Every physician of any experience must have encountered cases in his practice where death was not feared as much as being buried alive. He must recall promises having been exacted from him that he should take every precaution to avoid such an occurrence taking place. While with the stethoscope, the electric battery, and other tests, and waiting till putrefaction has set in, the scientific physician can guard against such a dreaded catastrophe, yet the very thought of it is sufficient of itself to make him advise cremation instead of earth-burial.

This is only a small part of what may be advanced in favor of cremation and against inhumation. Against incineration very little can be said. Only one objection has been raised which merits a few words. It has been urged that by the adoption of cremation as a means for the disposal of the dead, evidences of crime in case of poisoning could be removed and guilty persons escape punishment. With a view of elucidating this matter Sir Henry Thompson addressed inquiries to three hundred coroners, with the result of eliciting the fact that only one hundred exhumations had occurred in England and Wales during a period of twenty years, and of these but twenty were for suspected cases of poisoning. From the same source we also learn that there were only five exhumations and but one for alleged poisoning in England and Wales in 1886, during which year there occurred in these two countries 537,276 deaths. In many cases of poisoning all evidence and all traces of poisoning are destroyed and lost by the putrefactive changes which take place very soon after burial. In cases of inhumation, where the remains have been embalmed, who can say whether the poison found has been introduced before or after death? The finding of certain pathological lesions might raise a presumption, but only a presumption in a few cases, that death was positively and certainly due to poison introduced into the body ante-mortem. Furthermore, many of the mineral poisons may be detected in the ashes or in the smoke, and the vegetable poisons, with few exceptions, disappear in the process of decomposition. So few exhumations are undertaken in proportion to the number of inhumations that it amounts to nothing, particularly when the advantages of cremation outweigh those of burial so much. Forsooth, it may be looked at as an argument for cremation, as it may be the means of having such legal safeguards thrown around the granting of permits for cremation as will make it nigh impossible for a case of poisoning to escape detection. It will lead to a revision, if not to an abrogation, of our present loose system of granting burial permits. If it did nothing more, it would be desirable to adopt it.

What is there opposed to it? The process itself is so cleanly, so rapid, and so free from all offensive features that the most exacting cannot find fault with or take umbrage at it. Of this a convincing proof can be furnished by a visit to the crematory of the San Francisco Cremation Company, at Cypress Lawn, San Mateo County (a short distance from San Francisco), which is well worthy of inspection.

Religion hardly can be said to form a barrier to its practice. Some of the most eminent divines are outspoken in its favor. The dogma of

the resurrection cannot be utilized against cremation. If that were so, then what became of the blessed martyrs burned at the stake? Are those who have been burned to a crisp in trying to rescue a fellow mortal from death by fire, lost and denied salvation?

No, it is not so much religion as a sentimental prejudice that is opposed to cremation. It is a sentiment begotten of an education which is based simply on usage and custom, and which does not inquire into its *raison d'être*. Fortunately, it is the thinking world that governs and rules. It is to the thinking world that cremation appeals, and by which it will be heard. Opposition to it will disappear as its advantages are understood. Let the world brush aside the cobwebs of ignorance and superstition of bygone days, so that the rays of modern enlightenment may radiate over its mental vista, with the result of leading to the adoption of cremation as the universal means for the disposal of the dead of the future.

The shortness of this session does not permit of trespassing any longer on the time and indulgence of the convention, but sufficient has been said to justify the hope that the resolutions here presented may be adopted as evincing the views of this body:

Resolved, That this convention indorses and approves of cremation as a rational and sanitary means for the disposal of the dead.

Resolved, That all legal restrictions to it, where they are in force, should be removed.

Resolved, That governments should employ it on the battle-field in lieu of inhumation.

Resolved, That it should be adopted in all cases of infectious and zymotic diseases, and during the prevalence of an epidemic.

Resolved, That it should be made obligatory in all cases of Chinese decedents where it cannot be shown satisfactorily that they were under observation and treatment for their last illness, during five days preceding their demise, of a duly licensed physician and surgeon under the laws of the State of California.

SANITATION OF DWELLINGS, PUBLIC BUILDINGS, AND THOROUGHFARES.

By J. H. DAVISSON, M.D., of Los Angeles, Member of State Board of Health, ex-President of Los Angeles Medical Society, Member of American Public Health Association, Member of American Medical Association, Member of California State Medical Society, etc.

There is no department of sanitary medicine which concerns the masses as does domestic sanitation and sanitation of public buildings and thoroughfares. Their hygiene is not a subject of interest at intervals, like many other departments of our art, but always a live issue, and of paramount importance, because it involves the health and life of every individual at all times and places.

Household sanitation properly includes not only a consideration of the house and all that is contained in it, but its environs as well. It is not the object of this paper to enter into tedious details of location and construction, but to treat of the divisions of this subject in a restricted sense, to avoid a paper of too great length, dealing more particularly with sanitation of the interior.

All buildings, both public and private, should be located on high and dry ground, and with reference to the air currents or wind and sunshine. Residences and public buildings should be constructed, where admissible, upon the detached or cottage plan, rather than in rows and palatial, and upon foundations suitably prepared of cement or grout (except in California, where simply brick answers for small buildings), with proper elevation and thorough ventilation under the structure. One-story cottages properly planned and elevated, with good attics, may be constituted comfortable and hygienic residences; but in the revival of the colonial style of architecture—with a few modifications—the two-story residence is both artistic and convenient, economical and sanitary, and well adapted to any climatic conditions. Frame or wooden houses are best for our climate, while brick is most satisfactory in cold climates. The Spanish idea of *patois*, or large courts instead of dark rooms, in large buildings for every purpose, is to be commended, and our advanced civilization should discountenance piling brick, stone, iron, and mortar, or other building material, heavenward in the unsanitary effort to build domicile upon domicile and office upon office, when nature has provided so much territory. Indeed, the tall tower, monument, or church spire is but little in advance of the pyramids, and might, without irreverence, be displaced with something new, rational, sensible, and sanitary in our progressive age of reason. The tall church spires are sometimes more pleasing to the senses than many of their adornments. Imagine the spectacle of the angel Gabriel impaled upon a church spire, blowing his last trump! Such was the adornment of the First Presbyterian Church of the city of Los Angeles, until years of ridicule caused it to be displaced a few years ago by a globe as an emblem.

Every room, both public and private, should be large and well arranged for sunlight, heat, and ventilation. All plumbing should be

done with reference to sanitary results, and, where possible, should be open for constant inspection, and all fixtures properly trapped and vented to avoid siphonage. McClellan's automatic venting, though a little expensive, is probably the best for security against sewer-gas. All fixtures and plumbing in every building should be in constant use, or be frequently flushed, to prevent the seal of the traps being broken by evaporation, which soon occurs in our dry and airy climate. This may occur to summer residences and hotels at the seashore or in the mountains, and may occur to school-houses during vacation. All water-closets should be supplied with modern automatic flush-tanks, properly connected to avoid siphonage or other accidents; and with plenty of water, care in construction, and good plumbing, these modern, odorless, and consequently sanitary closets can be easily kept in order, and may be placed in any building with comparative safety.

Every house, private or public, should be properly heated, lighted, and well ventilated. It is a mistake, in California, or in any other similarly mild climate, to plan and construct houses, residences, or other buildings, without providing suitable heating apparatus. Although for the greater part of the year no artificial heat is required for health and comfort, still, in marine climates and near mountain regions the meteorological conditions are such as to require artificial heat for both health and comfort for a period of two or three months during the year. It is to be regretted that many residences and school-houses, and other public buildings, have been constructed with an utter disregard for heating—not being supplied with grates, furnaces, stoves, or steam or hot water heaters, and without flues or chimneys. In consequence of these gross defects in construction, and for other reasons—false economy—many resort to the vilest of all methods of heating, or attempting to heat, with kerosene lamps and stoves, and as a result such chambers are poorly heated, and filled with the unsavory fumes of kerosene, and they burn out the life-giving oxygen and replace it with noxious carbon dioxide. This condition of things is deplorable, though quite universal and most unsanitary. The statement has been often made that architects have not kept pace with the sanitarian, a statement which is oftentimes provoked by the false notions of economy of the householder, rather than lack of knowledge on the part of the architect and builder. Gas stoves and grates properly constructed are less objectionable on the score of accidents, than kerosene stoves or lamps, and are more satisfactory for heating in our climate, but they are not as sanitary as open grates or hot air furnaces with pure air intakes. Steam or hot water is very satisfactory for large buildings, and especially in cold climates where much heat is required with constancy.

The question of properly heating thoroughfares is even more difficult to handle than that just considered, and as yet no plan in use is entirely satisfactory. The trouble is not altogether one of heating, but also of ventilation. Several years ago my friend, Dr. Reed, of Mansfield, Ohio, made extensive observations with reference to heating coaches and sleeping cars on railway trains, and found varying temperatures at short intervals, owing to circumstances connected with running, stopping, etc., and after investigating the then methods of steam heating, he concluded that no method in use was satisfactory, and that no advance in that direction had been made in years.

Heating of steamships offers much less difficulty, and we will pass it

with this statement. Heating and ventilation are separated in theory but associated in practice. However correct this may be, provision for proper ventilation or pure air currents to displace dead or impregnated air should be made in all buildings, regardless of heating and independent of it. For large buildings and institutions the fan system of ventilation is now much in vogue, but its principal objection is the cost of maintaining it.

The water supply of every building, railway coach, sleeping car, or steamship is of the greatest importance. It is needless to say that the source should, if possible, be free from any suspicion of contamination, and the supply abundant and pure. In view of the possibility of pollution and the fact that there are so many hidden sources of infection, all drinking water should be recently filtered or sterilized by boiling. The Pasteur germ-proof or porcelain filter is probably the best, and can be and should be applied to the filtration of drinking water in dwellings, public buildings, and thoroughfares. It is simple in construction, easily attached to fixtures, easily cleansed, and not expensive. When there is danger of pollution or a suspicion of pathogenic germs, and a suitable filter is not in use, the water should be boiled, as boiling destroys all pathogenic germs in ten minutes. (Sternberg.) If boiling does render drinking water rather unsavory, it has the advantages of being effectual in the face of danger from infection, and it is within the reach of the most impecunious. Next to the air we breathe, water is probably the most important element in nature, and it should not only be pure but abundant. The British War Department allows fifteen gallons of water daily to each soldier, and this quantity contemplates a sponge bath. Cities and towns require more, while American cities allow about fifty gallons daily per capita, and some even more. (Rohe's Hygiene.)

Since ice has gone into such general use, its purity should always be tested by competent inspection before it goes to the consumer. If natural ice, its source should be guarded to prevent pollution, as freezing does not destroy pathogenic germs, notably the bacillus of Eberth, which is often found in natural ice. In the manufacture of ice all water should be distilled prior to freezing. While a member of the City Board of Health of Los Angeles, a few years ago, I introduced a resolution directing an ordinance which should require all artificial ice to be made from distilled water. A storm of indignation by certain ice factories followed, and I was accused of complicity with a few factories which distilled the water prior to freezing. But the resolution, which seemed at first so objectionable to certain factories, had the desired effect, as it corrected many errors and much carelessness in all the details of manufacture, and had the effect of calling the attention of consumers to the necessity of knowing the source and quality of their ice supply.

Although not properly within the purview of this paper, you will permit me to say that the average American eats, as he does everything else, in a hurry, and does not give that care to the selection and preparation of food products that their importance demands. Man being omnivorous, requires a greater variety of foods than other animals, and also requires that it shall be properly prepared or cooked prior to ingestion; and most foods which require cooking should be either boiled, baked, roasted, broiled, or steamed; but few should be fried. On coming to California most every one learns that California fruits are healthful, and acting upon that fact they eat to excess of oranges, grapes, figs,

pears, peaches, apricots, strawberries, olives, etc., forgetting their capacity for fruits, and suffer from digestive disturbances in consequence. Many in like manner learn that our California wines are healthful, and drink them regardless of indications, or, rather, contra-indications. Alcoholics are not essentially foods, and can be dispensed with in most cases, except where indicated for certain chronic ailments of nutrition, and their judicious use in health as table beverages. Though alcoholics have valuable therapeutic indications, as in severe fevers, like typhoid, typhus, pneumonia, etc., to arrest retrograde changes due to the temperature—than which there is no more potent agency—yet most persons in health are better without them.

Perhaps the most unsanitary features of dwellings, public buildings, and thoroughfares to-day are the furnishings—the carpets, curtains, draperies, and upholstery, to say nothing of the odious folding-beds in use in private and public houses. With tuberculosis unrestricted, heavy woolen carpets, rugs, curtains, and upholstery, as found in most all residences, offices, public buildings, elevators, and such thoroughfares as sleeping-cars and steamships, are hotbeds of infection and furnish conditions favorable for the reception, retention, and spread of tuberculosis, diphtheria, scarlet fever, and all diseases due to microbes and infections. These filthy woolens, chenilles, and plushes will retain the bacillus tuberculosis in a potential condition for two and one half months, or even longer, when hidden in these fabrics from the sunlight, as they are usually located in apartments. Tuberculous patients scatter the bacilli in the streets, railway coaches, sleepers, steamships, elevators, in fact, everywhere, and the sputum dries and becomes pulverized and floats in the air along with particles of dust, and the common mode of infection is the inhalation of these bacilli by the weak and delicate. The bacilli, also floating about in the air currents, lodge in drinking water and fall upon articles of food which do not require cooking, and are swallowed, which is the next most common mode of infection or spread of the disease. The same is true, in less degree, of other pathogenic microbes. How often is infection transported from town to town, and from State to State, and from continent to continent by means of the filthy carpets, plushes, and hangings of sleeping-cars and steamships! Welcome the day when sanitary science or fashion, which plays so important a part in our sociology, shall put an end to all these unsanitary furnishings and suggest something better in their stead. The genius of fashion that suggested the painted and inlaid floors instead of carpets, and wooden and leather furniture, with now and then iron or brass, instead of so much upholstery, made long strides in the right direction; but, unfortunately, these hygienic, rational, and beautiful finishings and decorations have not become universal, though there is yet hope for these beneficent innovations. Inlaid or painted floors, linoleums properly treated, with movable rugs of light materials, which can be easily cleansed, constitute the most sanitary finishings and furnishings at our command for all buildings and thoroughfares.

The restriction of infection by police regulations or quarantine is not absolute in practice. The history of every epidemic of cholera has proven the correctness of this statement, as with other germ-producing diseases; hence, we can only lessen the chances of infection by doing away with elements favorable for habitat and transportation.

The question of restriction of tuberculosis by restraint or relative

quarantine, from the nature and circumstances of development, confronts us with greater difficulties than all other infectious or preventable diseases combined, and from its prevalence and fatality it heads the list in importance. To-day every thoroughfare, elevator, public building, and many of our residences are filled with the fatal bacillus tuberculosis, which find lodgment in the unsanitary furnishings above mentioned. If we cannot quarantine the bacillus, we can render it homeless, in a measure, by substituting hygienic decorations and furnishings.

Cranberg experimented with many materials for removing the germs of infection from painted floors, walls, carpets, furniture, etc., and gave the preference to moist sponges; while others, including the Philadelphia Board of Health, recommended fresh bread. Many cities in France make obligatory a disinfection after death from tuberculosis, and the Philadelphia Board of Health, March 6th, declared consumption infectious, and recommended disinfection after death or removal. The plan in many German public institutions of supplying tuberculous patients with cuspidors containing a solution of bichloride of mercury (1 to 700), which should be acid and 1 to 500, and compelling patients to use them, should not be considered a hardship, and can be applied to buildings and thoroughfares.

The analysis of mortuary statistics in Massachusetts since the establishment of the Massachusetts State Board of Health, in 1870, by J. F. Allyne Adams, is most interesting, but conclusions are not always up to expectations. He concludes that since 1870 the death-rate is practically unchanged by sanitation. Though consumption has declined, and pneumonia, bronchitis, cancer, diseases of the brain, heart, and kidneys (diseases which are not preventable) have increased, the diseases of childhood, which include most preventable diseases, have been reduced 30 per cent by sanitation. (Wyman and Banks, Annual, 1893.)

The desire to cover the important points of this paper, together with the fact that the hygiene of residences can be applied with little variation to public buildings and thoroughfares in the main, led me to select so comprehensive a title, believing that the repetition of hygienic facts by sanitarians, and their enunciation and publication by Boards of Health, are the best means of educating the masses and disseminating correct ideas of sanitation.

INDIO—THE COLORADO DESERT FOR HEALTH.

By WALTER LINDLEY, M.D., ex-President of the Medical Society of the State of California, and Superintendent of the Whittier State School.

Indio, the central locality of the Colorado Desert, is situated in Riverside County, eighty miles from Los Angeles, on the Southern Pacific Railroad. It is the most arid civilized town in America, the rainfall in 1890 being 0.73 of an inch. Of this amount, 0.05 of an inch fell in February, 0.15 of an inch in April, 0.10 of an inch in August, 0.21 of an inch in September, and 0.22 of an inch in December. In 1891, there fell 3.06 inches, but this all fell in February and August, 1.91 inches having fallen in February and 1.15 inches in August. In 1892, there fell 2.69 inches. Of this, 2.09 inches fell in January, 0.35 of an inch in February, 0.25 of an inch in March. In 1893, there fell 3.60 inches. Of this, 0.03 of an inch fell in January, 1.61 inches in March, 0.95 of an inch in May, 0.05 of an inch in July, 0.75 of an inch in August, 0.07 of an inch in September, and 0.14 of an inch in November. Making an average annual rainfall of 2.50 inches.

Some idea of the temperature of this place may be gained from the following table for 1893: In January, the lowest point registered by the thermometer was 35°, the highest 90°, and the mean temperature at 7 A. M. 45°; at 2 P. M., 83°, and at 9 P. M., 58°. In February, the lowest point reached was 40° and the highest 90°. In March, the lowest was 40° and the highest 101°. In April, the lowest was 50° and the highest 100°. In May, the lowest was 60° and the highest 103°. In June, the lowest was 70° and the highest 111°. In July, the lowest was 75° and the highest 116°. In August, the lowest was 78° and the highest 116°. In September, the lowest was 70° and the highest 115°. In October, the lowest was 50° and the highest 102°. In November, the lowest was 30° and the highest 90°. In December, the lowest was 30° and the highest 80°.

The altitude of Indio is 50 feet below sea-level. It is in the basin which lies from sea-level to 350 feet below sea-level, and of which the Salton Lake of two or three years ago was a portion. This lake was about twenty-five miles from the town of Indio. Indio has a good hotel, post office, telegraph office, store, and an excellent water supply. Four miles from the town is an extensive grove of palm trees that are indigenous to this desert. In these forests at Indio there are five hundred of these giant palms, standing far enough apart so that they do not lose their individuality. When we go in the midst of them, one feels as though he is surrounded by the giants of the story books of his childhood, and almost expects to see them suddenly walk away. Almost all of these great palms have been burned around their bases. This has been done by the Indians. Some say they burn these trees in order to cause the fruit to mature rapidly. The dates from these trees are much sought for by the natives, and yet they will ruin the trees in order to get this fruit early. Others say that they burn the trees, believing that the aroma is gratifying and pleasant to the spirits of their departed friends. Whatever the cause, it is a great shame that these beautiful trees should be thus destroyed, and the Government should take some steps to protect

this unique forest. With a little care, this palm grove in the midst of California's great desert could be made one of the most attractive points in America. There are in this grove a number of little palm trees springing up, and in their first appearance they simulate a blade of grass. An expenditure by the Government of a few hundred dollars annually to protect these little sprouting trees and prevent injury to the older ones, would soon bring this remarkable place into a state of great beauty.

From Indio can be seen Mounts San Jacinto, San Bernardino, and Grayback, on all of which there is snow the year round. Near the town is an Indian village inhabited by the tribe known as the Cohuillas, who are said to be vegetarians and cremationists. About twenty miles from Indio are the great Volcano Springs, and twenty-five miles away are the Salton Salt Works. In fact, there are many things of interest in this vicinity, and one never grows tired of watching the varied tints of the mountains that surround this basin.

For many years I have seen indisputable evidences of the benefits derived from the climate of Indio. Persons suffering from rheumatism, asthma, phthisis, and nervous prostration are all benefited. I do not mean that all persons suffering from these diseases are benefited, but that a large proportion of cases in all these diseases improve greatly at Indio there is no doubt.

The combination of aridity and high altitude injures the person suffering from overwork and nervous trouble, while the aridity with a low altitude soothes and rests, and thus benefits those who have been suffering from a nervous strain. The physician who has a patient suffering from insomnia can conscientiously send him to Indio. The nights are most delightful. It is the usual plan of the hotel to throw open all the windows and doors, and practically sleep outside, and yet no person catches cold. The consumptive, who along the coast finds it necessary to protect himself from the night air, can here sleep out with impunity. The physicians recommending patients to try Indio should caution them to first write and secure accommodations at the hotel, because there is always a far greater demand than there is room for. The principal owners of this town would show their wisdom by putting up a number of three-room cottages, or say two rooms and a bath, so that the consumptive would not be annoyed by being brought in proximity to other invalids. These cottages could probably be built for \$300 each, and would thus solve the problem of giving comfortable quarters for the patient without necessitating the exposure to the depressing influence that comes from other invalids, or, if the patient is a person of means, it might pay for him to build his own cottage, and the meals could be served from the hotel. The frail patient should not attempt to remain at Indio later than May, and should not return before October, yet the sufferer from rheumatism might be benefited by remaining during the hot months. I have been out on this desert in midsummer and suffered very little inconvenience from the great heat. This is due to the dryness of the atmosphere. No sunstrokes ever occur, and men work out in the hot sun during the very hottest of weather. In this locality, California has a health resort to compare with which there is no other place in the world. Its great advantages are: first, aridity; second, mildness of temperature during the winter months; third, equality of temperature; fourth, excellent water supply; fifth, good hotel accommodations; and sixth, satisfactory railroad facilities.

RAVAGES OF THE BACILLUS ANTHRACIS IN CALIFORNIA.

By CEPHAS L. BARD, M.D., of Ventura, Cal., President Ventura Board of Health, President Southern California Medical Society, Member of State Medical Society of California, Member of American Medical Association, etc.

Of all the pathogenic bacteria, none is so familiar to the profession as the bacillus anthracis. It is not only the first which was subjected to artificial growth, but on account of its ready susceptibility to culture, is usually selected in experimentation. It eagerly accepts an invitation to feed upon almost everything which may be offered it. So marked is this disposition and so easy of manipulation is it, that it has always been regarded as a great favorite by the bacteriologist. By him it is prized as much as is the frog by the physiologist. Its utility in the investigation of infectious diseases and in the study of the action of germicides, has been of inestimable value to mankind. Its beneficial employment within the laboratory to some extent compensates for its disastrous effects outside its walls. Unaided by the fostering hand of the bacteriologist, it is never found free in nature. Its sole habitat, for any considerable period at least, is the body of one which has suffered from the effects of anthrax or splenic fever in some form of its manifestations. Multiplying with marvelous rapidity by fission or segmentation, it produces its ill effects mainly by relieving the red blood corpuscles of their burden of oxygen, and by impairing their usefulness as vehicles of that essential gas. Its increased numbers vitiate the vital fluid, rendering it unfit as a pabulum, and by blocking up the blood-vessels they interfere with the nutrition of important organs. Davaine states that a single drop of blood often contains eight to ten millions of these destructive micro-organisms. Within the body it exists only as the rod-shaped bacterium, as illustrated in our text-books. As such, after the death of its victim, its existence is ephemeral and its power of inflicting additional damages limited. It succumbs quickly to ordinary physical and chemical causes, especially to heat, cold, and strong sunlight. If, by chance, it should with food enter the alimentary canal, it is speedily destroyed by the gastric juice. If wafted into the pulmonary tract by a breath of air, it greedily attacks the lungs, but its action is chiefly a local one. It may also gain, with difficulty, admission to the system by being brought in contact with an abrasion of the integument. So slight is its tenure on life that it would not be an object for serious consideration were not its perpetuity secured by sporulation or germination. The spores or seeds, the result of this wonderful process, are never found within the body of a living animal or within the intact, unbroken carcass of a dead one. The presence of oxygen is absolutely requisite for their formation.

When fully formed, unlike their progenitor, the bacillus, they are almost absolutely indestructible. They luxuriate in a prolonged bath of a 5 per cent carbolic acid solution, and their resistance to fire is salamandroid in quality, being capable of existing in a temperature of

212° F. for a short period. The gelatinous envelope in which they are encased is probably, without exception, the hardest substance known in the vegetable kingdom, sustaining in it the position that the diamond occupies in the mineral domain. The spore is the test-object used in the laboratory for the investigation of the action of germicides, and any agent which can destroy it can safely be recommended to the surgeons as an efficient antiseptic.

Sporulation prolongs the existence of the bacillus indefinitely. As a spore it may so remain for years. It has been known to retain its vitality for more than twenty. Its latency depends entirely upon its environments. Like the Egyptian corn, which has been stored away for centuries in the pyramids, it only awaits favorable conditions to be aroused into activity. The "open sesame" which effects the bursting of its flinty shell and the metamorphosis of its contents to the original organism, is the presence of a suitable culture medium, consisting of moisture, oxygen, and a nitrogenized pabulum. This, under favorable circumstances, may be offered by the soil, but no other exists aside from that prepared in the laboratory, except that of a living body. Ingested with food, it is not stayed by the gastric juice, but passes unscathed through the pyloric portal to the intestinal tract, where the alkalinity of the secretions and the temperature favor their rapid development, and, as bacilli, they quickly gain admission to the system through the lymphatics, or more directly by piercing the blood-vessels. Like the bacilli, also, they may be carried into the lungs by dust-laden air, where they obtain lodgment, develop, and pass swiftly into the system. They may also produce local and general infection by being brought in contact with sores or abrasions of the cuticle, where the conditions are favorable for their lodgment and development.

One form of infection is directly attributed to flies, mosquitoes, ticks, and other blood-suckers, carrying the bacilli or spores from a diseased or dead animal to a living one. The fly and mosquito, as we well know, are the carriers of other pathogenic germs. Livingston, the African explorer, describes the tsetse fly, which transmits to all bovine animals a slow, wasting fever. It is well proven that the Texas cattle fever in the majority of cases is due to infection from ticks, which burrow into the skin and inject the poison which they have brought from diseased animals. Surgical instruments which have not been sterilized after use have been known to transmit the disease under discussion. A short time ago a German surgeon reported a case of infection in an operation wound due to the use of infected ligature, known in the market as catgut, but the principal supply of which is derived from the intestines of lambs. In this instance, the animal from which the material was obtained, was diseased by anthrax. That the bacillus may be transmitted from the pregnant female to the fœtus is as yet an unsettled point. As the lacteal secretion is dried up very rapidly in diseased animals, we have no record of any infection from the use of their milk. That some animals are more susceptible to splenic fever than others, and that some are immune, was quickly noticed by the early observers. It is chiefly confined to the herbivora and omnivora. The carnivora are almost immune. Principally observed in sheep, cattle, and horses, it claims victims from the fauna of the entire globe. The heavy-furred beasts of the Arctic and the huge pachyderms of the Tropics are laid low by this infinitesimal organism. Birds, some varieties more than

others, succumb to it, and it has been known to affect fishes. The receptivity or susceptibility of man is less marked. An inoculation which would destroy one of the lower animals, in him will produce a local manifestation only.

The symptoms of the disease in animals vary greatly, depending upon the site of infection. If in the intestines, they are very similar to, if not identical with, those of septicæmia. If in the lungs, they correspond with those of pneumonia, and if in the skin, they consist of postules, carbuncles, and œdemas, which may also appear on the mucous membrane. Autopsies reveal rapid decomposition, coagulated blood, enlarged friable spleen, and extravasation of blood in nearly all of the internal organs. More or less blood-stained fluid is found in the cavities of the thorax, pericardium, and abdomen. The same forms exist in infected man, and the symptoms are closely allied to those described. Considering that he is not a grazing animal, and therefore less liable to ingest spores with his food; that the sporule is absent in freshly dressed infected meat; and that the bacillus, if present, is destroyed by the gastric juice; it would not be expected that many cases of the intestinal form or true splenic fever, so common in animals, would be encountered in men. Although we have no late mention of such occurrence, we have the authority of Kircher for the statement that 60,000 people died in Naples and vicinity in 1617; and of Law that 16,000 perished in San Domingo in 1770, from feeding upon meat procured from infected animals. Rawitch states that thousands of persons die every year during which the disease appears in the steppes of Russia from eating infected horse flesh. This alarming mortality is attributable to some extent to the filthy habits of the natives of the sections named, and to the contamination of the food, subsequent to its cooking, by the knives, forks, dishes, and tables used. According to Leube and Masing but two cases of splenic fever in man have been known to recover. The sudden deaths occurring in workmen employed in woolen mills, especially those in charge of assorting and combing the material, were inexplicable until 1880, long after Davaine's announcement of the etiological relationship of the bacillus anthracis to the disease under discussion, when Professor Greenfield, of London, under governmental auspices, conducted his elaborate investigations and showed the connection of the bacillus with what is known as the "wool-sorter's disease." The symptoms of this form of anthrax are the counterpart of those pertaining to pleuro-pneumonia. The most common variety of the disease, however, to which our attention as physicians is called, is that local manifestation known as malignant pustule. Appearing in uncovered portions of the body, produced by contact with diseased or dead animals, or their hides, or by bites of flies and insects which have fed upon infected flesh, it manifests itself as a red spot, followed by a vesicle which soon becomes a foul gangrenous pustule, very dark in color, and surrounded by a hard, reddened areola. If situated on an extremity, the entire member participates in the inflammatory action, becoming inflamed and hardened, and there is involvement of the neighboring lymphatics and glands. If on the face, the entire countenance becomes darkened and distorted; the eyes close; and in bad cases there is extension to the neck, embarrassing respiration and deglutition. The mortality from malignant pustule is not great. In infected European districts it has been rated by Nicolai at 5 per cent, and by Lengyel and Korani at 9 per cent. The slight fatality is

explained by the fact that the pores and gland ducts are the habitat of other bacteria, which find access to the system as difficult as does the bacillus anthracis through the perfect armor in which the human body is encased.

Anthrax is a very ancient malady, and there exist many allusions to it by the older writers. The "grievous murrain" which swept from the plains of Egypt the herds of cattle, horses, camels, asses, and sheep was due to the little micro-organism so assiduously cultivated by the bacteriologist. It is interesting to note in the account of this epidemic, as described in Exodus, that the disease was confined to the herbivora, and that there is no mention of the carnivora succumbing to it. Virgil, in the Third Georgic, describes a murrain which is generally accepted as being identical with splenic fever. It is supposed to be the "black blane" of the old English writers, and the "elf-shot" creatures of the all-observant Shakespeare's fancy were those affected with it. No other disease, excepting tuberculosis, is so widely diffused, and but few others have been so disastrous. As an example of its ravages, it may be stated that in a single year (1864) 72,000 horses were destroyed by it in Russia. Bollinger states that in the Province of Novgorod, during a period of four years, more than 56,000 animals, including horses, cattle, and sheep, as well as 555 men, fell victims to it. While every portion of the globe has witnessed outbreaks of it, some countries, owing to the character of the soil and climate, have been the greatest sufferers. Sections in which swamps and overflowed land exist, where the summers are very hot, are noted for its frequent and severe epidemics. Russia, France, Germany, Italy, and Spain have not been free from it for years, and so common is it in Siberia that there it can be regarded as panzootic. It is said to be the disease which, prior to 1850, the year in which the bacillus was discovered and its causal relationship established, destroyed many animals in the Southern and Southwestern States of our country. Gross states that it existed in Louisiana in 1851, and we have positive knowledge of its existence in New York State during the years 1870 to 1880. Sternberg, in his Manual of Bacteriology, the only standard work in America, states that anthrax does not exist in the United States. Coming from an infected region, and intimately associated with the treatment of the disease, so far as man is concerned, at least, I am prepared to say that the soil of certain sections of our State is polluted by the presence of the bacillus anthracis, and has been so for more than twenty years, during which period there have been frequent outbreaks of the disease in animals, so frequent, in fact, that anthrax may be said to be enzootic in the mentioned district. Its diagnosis has not only been substantiated by the characteristic symptoms and its transmission to man, but has been confirmed by finding the bacillus in the blood of affected animals by the use of the microscope in skillful hands. The region referred to, so far as my knowledge goes, comprises portions of the counties of Los Angeles, Orange, San Diego, Kern, and Ventura. The assertion of our Surgeon-General has been due to the fact that his attention has not been called to it, and that the subject has not secured from medical men the consideration it deserves.

The literature pertaining to the malady as it appears in the infected counties is limited, consisting of but two papers, one by Dr. D. Granville MacGowan, late Health Officer of the city of Los Angeles, and the other by myself. These were read before the Southern California Medical

Society, and were afterward published; the former in the "Occidental Medical Times," August, 1892, and the latter in "The Southern California Practitioner," in December of the same year. In my present description of the appearance and existence of the disease, I confine myself to the results of my observations in my own county, where I have practiced medicine for more than a quarter of a century.

In the summer of 1872, a Basque sheep owner, Peter Edouart by name, residing near Bakersfield, placed in his band of sheep, 5,000 in number, some bucks which had been imported from an infected district of France. Shortly after this acquisition the animals began to die from the effects of a disease which to the owner was unknown. Concluding that it might be due to local causes, he started toward the cooler country of the coast. Descending the San Francisquito Cañon, he proceeded to San Fernando, and from there to the plains of Ventura County. In six weeks he lost more than half of his flock, and the localities where it grazed are infected to this day. Quoting from my previous article: "They have been swept by fire; deluged by rain; torn up by the plow; exposed to the glary heat of a southern sun; deserted for years at a time; but the resumption of their use as a range has invariably resulted in an outbreak of the disease."

One of these ranges, two years after its infection by Edouart's band, was rented by a sheep man, who placed on it a band of 8,000 sheep. Shortly after its occupation the malady appeared, and in two years' time the owner, who was stubborn, deaf to advice from others, and determined to remain, lost every one of them. On the same ranch, a few years later, the majority of a band of cattle, 700 in number, succumbed to the same disease.

Last November a firm of cattlemen leased an infected ranch, upon which 750 indigenous cattle were at the time grazing. No manifestation of the disease had occurred for years. The importation of 195 head from an uninfected locality, but fifteen miles away, was followed by the appearance of the disease, which virtually carried away every one of them. Nine hundred more were brought in from Arizona, and of these 600 perished, the remainder being saved by their removal. The cattle which were native to the ranch were not infected. The process of infection since its inception has steadily progressed, so that many places in the mentioned counties are for the time being unfit for grazing purposes.

Plethora is a predisposing cause, and fat animals—those prepared for the market—are most apt to succumb to it. It is roughly estimated that the mortality in the entire infected district since its appearance is 6,000 cattle and more than 100,000 sheep. The outbreaks do not occur annually, and are more apt to occur in those years characterized by wet winters, followed by very hot summers. A few horses used by vaqueros on the infected ranches have died, but there is no record of any epidemic occurring among them, as the ranges have never been devoted to them. Hogs, especially those fed upon infected carcasses, and those grazing in infected regions, invariably perish. So do goats which accompany the bands of sheep. The infected district is noticeably deprived of deer, hare, and the swarming colonies of rabbits and spermophiles. The quail which feed on infected soil, and the buzzards which claim the carcasses as their prey, are not affected. Chickens which share the lot of the herder in his peregrinations are immune, and there is no evidence that the trout streams have been polluted by the death of their finny

occupants. The assertion that the carnivora are exempt is verified by my observation. The shepherd's dog and the thieving coyote feed on diseased flesh with impunity. "Although the disease in animals," quoting again from my former article, "is usually manifested in the internal form, we, as physicians, as yet have been brought in contact solely with its external manifestations. No case of splenic fever occurring in man has as yet been recorded in Southern California. One sudden death noticed in my field of work has been generally attributed by the sheepmen to eating the flesh of a sheep which had succumbed to the disease. Who knows but what some other deaths happening in remote localities, where the diagnosis has been obscure, may have been due to this form? The immunity of the herder to the internal form is doubtless due to the fact that he seldom, if ever, partakes of infected meat. It is readily seen, however, that he could eat such meat with safety, provided that it was very fresh and taken from an animal which had just expired, and before the development of sporules, for the entrance of bacilli into the alimentary canal is rendered innocuous by the gastric juice. The lessened liability of the carnivora to the disease may also account for the immunity of the herder, whose diet is so largely animal in character." Since the first appearance of the disease there have been at least one hundred cases of malignant pustule in Ventura County. They have corresponded in every particular to the description already given, and with but one exception were situated in exposed portions of the body. The majority of these were in herders who had inoculated themselves when skinning diseased animals. The others were inoculated by fly bites. In this number were two ladies and two children.

One case in a man, situated on the arm near the shoulder, was due, I think, to the medium of a tick. I have never seen a case transmitted from man to man or from man to animal. All of my cases, with the exception of one, resulted in recovery.

The fatal case, the first and only one to occur in Ventura County, was, with the two fatal cases recorded by Dr. D. G. MacGowan, the third and last recorded in California. Its particulars and those of the subsequent autopsy, the only one ever made in California, and quite possibly in America, are fully described in my other article. The examination made three hours after death showed signs of advanced decomposition, but the usual gas bubbles which are found in this condition were absent. A great deal of stress is laid on this feature by the bacteriologist as a result of his observations in the laboratory. Infiltration of blood existed in the subcutaneous cellular tissue and large splanchnic cavities. The lungs were inflated, congested, and œdematous. The heart was filled with black blood. The liver and kidneys were normal. The spleen was adherent with thickened capsule and but slightly enlarged; it was extremely soft, pultaceous and crepitated like lung tissue. A microscopical examination, made six hours after the autopsy, of blood obtained from different portions of the body, showed it swarming with the rod-shaped bacilli and their spores. Sections of the spleen, liver, and the involved axillary glands, under the glass, also exhibited their presence in countless numbers. This rapid development of the spores, which, as already stated, are never found in the living animal or intact carcass, is remarkable, as in their artificial cultivation a longer time is required.

From the recorded cases of Dr. MacGowan and of myself the mortality of malignant pustule would seem to be much lower than that existing in European countries. The herder, who is usually a Spanish or French Basque, is in constant dread of this terrible scourge and is quick to apply for relief when infected.

The treatment of the disease, as variously recommended, consists of excision, cauterization, and the local and hypodermic application of carbolic acid, iodine, permanganate of potassium, or corrosive sublimate. Davis-Colley reports the successful use of ipecacuanha, locally in form of powder, and internally in five-grain doses every four hours. Muskett, who in South Africa treated fifty cases without a death, used it also. Evans in experiments finds that this drug in five, four, three, and two grains, added to tubes containing one and a fourth drachms of broth, invariably destroyed the vitality of the anthrax bacilli present, and no growth occurred in the tubes inoculated, provided that the bacilli contain no spores.

The treatment usually followed in California's infected district has consisted of the hypodermic and local application of carbolic acid. During the last few years, however, I have relied upon deep crucial incisions and the application of a saturated solution of the mercuric bichloride, supplemented by the usual antiseptic dressing. In all cases, stimulants, quinine, and the tincture of the chloride of iron have been administered internally.

What can be done to suppress this standing menace to a waning but nevertheless an important industry? What action can be taken to prevent contamination of our soil, infection of our herds, inoculation of their guardians, and the pollution of the poor workingmen in distant factories? That the disease will continue to exist is a prediction in accordance with our knowledge of its characteristics. California furnishes the most favorable predisposing causes: nutritious grasses, inducing plethora; alternation of cold nights with warm days; rich alluvial soil; and wet winters, succeeded, especially in the interior valleys, by hot summers.

While France and Germany enact and enforce laws tending to the suppression of the disease, England and the United States have displayed no legislation in that direction.

In our own State, however, a law was framed by our Legislature on March 16, 1889, authorizing the Supervisors of the different counties to appoint, if so requested to do by a petition of not less than fifty names, a Sheep Commissioner, whose duties were to be defined and determined by said Supervisors. Reference to the ordinances and transactions of the several counties in the infected district show no appointment at any time of any such official. The stock owner can do much for himself and charge unaided by the agency of the law. Drainage and cultivation of the range will materially diminish the chance of its contamination. It can be stocked with Algerine sheep, and some other varieties which are immune. We have no knowledge of any brand of cattle or horses, however, for which the bacillus anthracis is not pathogenic. He can protect his flock from importation of infected stock. In the event of an outbreak, by leaving his range and keeping his animals in motion, he can manage to save the bulk of them. As the disease is only communicable by the inhibition of the bacillus or spore, the moving herd is comparatively safe, as the cause exists only in the discharges and

carcasses which remain behind to infect others which may graze on the abandoned pasture. The only effectual method of preventing future contamination consists in the destruction of the carcasses of those which have succumbed to the disease. This can be done by burning them or burying them deeply in the soil. Owing to the prevailing scarcity of fuel, especially on our treeless plains, the first method is not very practicable. Owing to the disinclination of the herder, the second is never fully accomplished, the body usually being deposited just beneath the sod. Burial at the depth of six feet is quite effectual. Whilst sporulation may occur in surface soil at any temperature between 59° and 110° Fahr., it cannot exist in a carcass covered by six or eight feet of earth where the perpetuation of the infection is only preserved by a continuous generation of the bacillus. Pasteur's theory, that the common earth-worm may carry the bacilli to the surface, where sporulation would quickly ensue, does not detract from the efficacy of this method of disposal of the carcass, for it has been lately shown that it is not tenable, and furthermore earth-worms do not exist in any great numbers in California. In Siberia, where splenic fever is enzoötic and where its ravages are so terrible as to be called the Siberian plague, great reliance is placed in deep burial as a preventive measure; and during the frequent outbreaks large numbers of soldiers are detailed to carry out this sanitary provision.

Protective inoculation, introduced by Pasteur about twelve years ago, has been extensively used in France, and to a slight extent with cattle in California's infected district. It has not been followed, however, by the success predicted for it. The fluid used in the process is bouillon, in which the bacilli, modified by heat, have multiplied, and are present in great numbers. The French claim that it has been successful with them, and that their losses of animals have been much reduced by its use. Others contend that a great difficulty exists in the variable degree of alterations of the vaccine and the varying susceptibility of animals. They admit, however, that whilst in sheep the losses are greater and directly due to vaccination, that in cattle it is accompanied by fewer losses, and that it is protective in localities where the disease appears annually and is due to the polluted soil. It should be remembered that the culture fluid contains bacilli, which may regain their original virulence, and the vaccination, therefore, should not be used on uninfected soil. As a prophylactic measure in man, especially in the factories, wetting the wool, which to some extent prevents the spores from floating in the atmosphere to be inhaled by the workingmen, has proved successful. Those engaged in removing hides from diseased animals and in dressing them, which, by the way, are readily recognized by their darker color, can protect themselves by using gloves or by coating their hands and arms with vaseline, lard, or oil.

Without the heavy hand of the law, however, but little can be done to stamp out this scourge so menacing to our industries. It should be invoked to prevent the importation of diseased animals; to compel owners to destroy at once the carcasses of those which have died; and to make it a penal offense to sell infected meat, or to ship hides removed from diseased animals. These measures can be obtained by the appointment of an inspector who would rigidly enforce the enactments, or by some other form of legislation.

An appeal from this assembly would accomplish much toward obtain-

ing the desired end. As individuals, we owe it to our patients and to the welfare of the commonwealth. We should be ever aware that confined as is the disease and slight as have been the outbreaks as compared with those in other countries, we may witness its extension with corresponding mortality.

"Nor do those ills on single bodies prey,
But oftener bring the nation to decay
And sweep the present stock and future hope away."

SANITARY LEGISLATION.

By H. A. SPENCER, V.S., of San José.

MR. PRESIDENT AND GENTLEMEN: Recognizing, as I do, that the members of this Board are the select of one of the grandest and most noble of all professions, whose conscientious aims are directed to the restoration of the sick, the amelioration of suffering, and the promotion of longevity in the human race, it is with no little trepidation that I appear before your honorable body as an earnest advocate to advance the interests of and assist in elevating the veterinary profession of this State. In furtherance of this motive we supplicate for the privilege of coöperating with you in your great work as public sanitarians.

While I am aware that quackery and ignorance have in the past done much to bring into disrepute the profession I have the honor to represent on this occasion, I am confident that through the untiring efforts of our members, the cloud that has heretofore obscured our utility is fast being dispelled, and that our really honorable and scientific vocation is being recognized as one of the most useful adjuncts to the medical fraternity.

In witness of this, among other things may be cited the interest taken and money expended by our Government in the creation of the Bureau of Animal Industry at Washington, whose renowned investigations are presided over by a most efficient corps of veterinarians whose researches in micro-histology and morbid pathology are of world-wide repute, and through the indefatigable labors of these capable gentlemen only, the grave question of the admission of American pork into Germany was settled; to their vigilance and the assistance of the profession at large the dreaded scourge of pleuro-pneumonia contagiosa, that so effectually put an embargo on the exportation of American beef to Great Britain, was eradicated; through the untiring efforts of the veterinary profession the deadly danger of tuberculosis in the bovine family being transmitted to mankind through the mediumship of beef, milk, and butter has finally been made so manifest that great herds of extravagantly expensive imported cattle have been subjected to rigid examinations by ordinary methods and the application of tuberculin as a diagnostic agent, and in many instances they have been sacrificed to the rendering tank as dangerous to the health of the human race. A large and elegant herd of Jerseys, the property of an ex-Vice-President, and those of many of the fancy dairies supplying milk and butter to aristocratic families of New York and other large cities, have been completely destroyed through the energy of our Government and State veterinarians, aided by and with the sympathy of the medical profession.

We come to you, gentlemen, believing that through your coöperation and sympathy we may procure better and farther-reaching legislation for the protection of our profession, that the line of demarcation between the veterinarian and the empiric may be made broader, and to this end, we believe that with your assistance we may be enabled to prevail on

some future Legislature to create the office of State Veterinarian, whose duty it shall be to guard vigilantly the stock interests of our fair State and see that contagious or infectious diseases that may and do exist among the lower animals, menacing the public weal, be stamped out and not allowed to recur. We think this to be a step in the right direction. To this end is the employment by, or appointment to, this Sanitary Board of a veterinarian, who, through intimate knowledge of the disorders and plagues of the lower animals, would most unquestionably be the means of lightening your labors in no small degree. We further claim that the example of the larger European and Eastern cities in the appointment or employment of a veterinarian on local Boards of Health for the inspection of abattoirs, meat, milk, and markets generally, is of vital importance to the maintenance of good health and to a diminution of the death-rate. This is amply illustrated in the city of Oakland of this State, where an epidemic of typhoid fever was traced to the milk supply. The Board of Health were immediately empowered to take such measures as their judgment dictated; they therefore appointed a veterinary surgeon at a modest salary per year, who actively set to work, and the result is manifest in that, from a city where beef, fish, milk, butter, and vegetables were of questionable purity, it is to-day the best and cleanest victualed city in California.

MEAT INSPECTION.

I am of the opinion that Boards of Health in all instances ought to insist that the beef, pork, and mutton killed and prepared for human consumption should be of animals in the perfection of health, and with that end in view, a veterinary surgeon should be employed as inspector, whose duty should be to examine the animals intended for food, both prior to and after slaughter.

For while the danger is unquestionable, it is an indisputable fact that there frequently is an enormous traffic in diseased meat, and that under the existing order of things, the knowledge of this criminal practice escapes detection from the lack of a proper officer and needed legislation. We know that there is a disposition on the part of many persons to shield the rebukes of conscience that such nefarious work must instigate, with the threadbare excuse that it were a pity that so much material should be allowed to waste. It is quite true that an occasional newspaper report is the source of some alarm to these persons, and for a time renders them cautious, but these reports are infrequent, and give the public but a meager idea of the extent that these infractions on decency occur. It is an indubitable fact that cattle, sheep, and swine are often attacked by diseases that their value would not justify the expense of medical treatment for, and in these instances the services of the butcher are sought to the exclusion of the trouble and expense of treatment, and while we would prefer not to, we are forced to believe that their carcasses find their way to markets and are sold as wholesome food. In my judgment, private slaughter-houses are ordinarily the centers that from their privacy are peculiarly adapted to the perpetration of these atrocious villainies, and hence, in the opinion of those who have given the matter attention, slaughtering should be confined to public abattoirs, where it could be under the immediate supervision of competent veterinary inspectors.

MILK INSPECTION.

There is no question but that the universal use of milk as an article of diet in health and sickness, and its consumption by old and young, render its purity a matter of vital importance. Regarding the inspection of dairies, the same remarks made in reference to the examination of meat are equally or perhaps more strongly applicable. It is undoubtedly the veterinary surgeon's province to diagnose disease in the animal from whence the lacteal secretion is derived and sold for human consumption. The sanitary condition of the dairy and the premises is an important question to be determined, but the health and the vigor of the animals themselves are of more consequence. Unfortunately, tuberculosis is a frequent malady among dairy cows.

For me to comment on the danger of consuming milk, the product of cows affected with this disease, is unnecessary, especially to intelligent medical investigators, and it is sufficient to say that the condemnation and destruction of stock thus affected is the wisest sanitary measure. Further, the sale of milk, the product of cows suffering from any febrile disturbance, should be prohibited. I deem it argumentative to the issue to present for your consideration a few of the contagious and infectious diseases that attack our domestic animals, and are sources of menace, both to the health of man and to the finances of the nation. The dreaded scourge, tuberculosis, which is so fast and surely decimating the human race, has, in the belief of many, its origin in the bovine family, or, if not its origin, at any rate a fertile soil for its multitudinous increase; and while it may not be news to any of you gentlemen, it is certain that if the laymen understood this, and the dire disaster that must naturally follow from the indiscriminate sale of meat, milk, and butter, the product of many dairies affected with this disease, and that in nearly every community in this broad land dairy farms and milk ranches are to be found where tuberculosis not only exists, but fairly runs riot, I take it, that it would be needless to ask for assistance, for the people would, with one accord, not only ask for sanitary legislation, but demand it, and in demanding, would make it one of the issues that aspirants for legislative honors would be compelled to pledge themselves to, before they could expect elective preferment entitling them to a seat in either house. To talk, as has been suggested, of isolating from community and friends the poor, enfeebled consumptive, while mercenary and ignorant men are permitted to sell the products of an old diseased cow, is worse than idle; it is barbarous.

Continuing in this line of reasoning for better sanitary laws, we may mention other cattle diseases communicable to man through inoculation, as actinomycosis, a disease due to a micro-organism, and repeatedly produced in the human family by accidental inoculation of the spore or fungi, actinomyces; also anthrax, or, as it is known in human medicine, charbon, or malignant pustule, and the kindred anthracoid diseases. So might be enumerated other cattle diseases that are either infectious or contagious to our race, as of instances of outbreaks of diphtheria that for a time staggered the medical attendants as to its origin, and which was finally traced to the family cow.

We are continually reminded of the existence of glanders in the horses of this State, and not a few human lives are sacrificed annually through the agency of this terrible malady. Just so long as the laws allow

unscrupulous dealers to barter in this kind of stock and go unpunished, just so long will reputable citizens be ruthlessly murdered and valuable property interests sacrificed to the greed of gold. I refrain from going into details and producing tiresome statistics, as I appreciate the value of time to your honorable body. I shall only briefly call your attention to a few other diseases that are life-destroyers and treasury-depleters, and should be met with safe sanitary laws, administered by officers chosen for their peculiar educational qualifications to recognize them: foot and mouth disease, or epizooty, aptha, rinderpest, trichinosis, and hog cholera, by whose ravages alone the farmers of the United States have sustained a pecuniary loss sufficient to ransom a kingdom.

And now, gentlemen, in thanking you for listening so attentively to my feeble efforts to convince you that an honorable profession seeks your assistance and support in a demand for better laws and more reputable social caste, I trust, if I have appeared in the least aggressive, you will attribute it to an error of the mind, actuated by zeal for what I believe to be a just cause, and not to any intention to be rude, for I am still stinging from a rebuke administered for having had the temerity to read a paper of a veterinary friend's before an association of physicians, one of whom gave as an excuse for non-attendance, that he was chagrined that an association of medical men should allow a "hoss doctor" to bore them with his thesis. If I have succeeded in awakening one sympathetic throb in your hearts for our cause, I am deeply grateful.

GLANDERS AND THE USE OF MALLEIN AS A DIAGNOSTIC AGENT.

By C. B. ORVIS, D.V.S., of Stockton, Cal.

MR. PRESIDENT AND GENTLEMEN: Being entirely unaccustomed to addressing a gathering of physicians, it is with many misgivings that I present the few remarks that I shall make upon this subject.

I am somewhat at a loss to know just what phase of the subject to present, or in what manner to present it, that it may be either interesting or instructive. Should I fail in either or both, I yet hope that it may at least cause some remarks to be brought out that will be productive of good.

While I entertain many doubts, yet I feel highly honored in being invited to present to so intelligent a body as the State Sanitary Convention my thoughts and experience upon a subject of so great importance to our State, both from a pecuniary and a sanitary standpoint.

The existence of glanders in our several localities is far more prevalent than is commonly supposed, it being a disease of so mild a character in many instances that it exists unobserved. In many cases, also, the disease is so obscure that the most expert are unable to make a positive diagnosis, or possibly even a correct one.

There is probably no disease that has given the veterinary profession so much trouble and difficulty in this regard. The tests and experiments to prove the existence of latent glanders have been numerous and varied. The use of drastic cathartics, subjecting the suspected animal to exposure, overwork, etc., with the object to induce acute symptoms, have all been used with usually very unsatisfactory results. If any results were obtained, the time and trouble necessary to bring them about, and the harboring of the suspected animal, so dangerous to both man and beast, that the use of some agent to enable the practitioner to make a positive and speedy diagnosis becomes a positive necessity, as well as one of inestimable value. That we now have an agent that, from the experience of others as well as our own, a practically positive diagnosis of glanders can be made, I am thoroughly convinced. In the use of mallein I feel certain that we have a safe, sure, and reliable agent.

The time has certainly arrived when all veterinarians, and sanitarians as well, should make themselves thoroughly familiar with the uses and value of mallein and tuberculin as diagnostic agents. Every practitioner in the veterinary profession, and especially every State and county veterinarian, should be supplied with a quantity of these agents, for plenty of opportunities for their use will be presented. It seems to me that with proper sanitary laws and competent officers to execute them, with the use of mallein, glanders should be thoroughly stamped out, especially in our rural districts, in a comparatively short space of time. Not only should suspected cases be tested, but all exposed animals should be tested and retested until all diseased animals, whether of an occult or positive nature, have been detected and destroyed.

It is my sincere desire that every physician in this State, more particularly members of Boards of Health, who are not fully informed as to the value of this new agent, should so inform themselves at once. The Boards of Supervisors of the several counties are receiving notices from various parts of their counties of the existence of cases of glanders in those localities. As a rule, no heed is given to these complaints, and in consequence, glanders exists in nearly every township in many of our counties. I am sure the assertion would apply to Stanislaus County, especially where it borders upon San Joaquin, and I have no reason to believe Stanislaus is any more overrun with the disease than many other counties, viz.: Calaveras, Tuolumne, Merced, Fresno, etc.

The transmissibility of this disease to nearly all animals, including man himself, and its certain fatality to all, make it one of the most to be dreaded communicable diseases that originates in the lower animals. That glanders frequently exists in man undetected, I am confident; or if recognized by the attending physician, it is not recorded. Two such instances have come under my observation in Stockton; that is, I suspected the cases, though not admitted by the physicians. I feel confident that if the number of cases of glanders in persons that have existed in our State during the last ten years could be given here to-day, it would be a surprise to every one.

If this be a fact, and I cannot doubt it, we require the aid of this Board, of all local Boards, and of every humanitarian, in every suitable manner to check the spreading of, and finally to eradicate, this dread disease. So, then, we ask your coöperation and influence in this direction. Whether it be done by having made a thorough inspection of the different counties by competent persons appointed by the Supervisors, by the different Boards of Health, or otherwise, it matters not so long as the work is systematically and thoroughly done. I believe it should be governed by State laws, under the direction of a State Veterinarian; but we cannot afford to wait to enact laws and put them into operation. I know of but three counties that have appointed veterinarians, viz.: Santa Clara, Los Angeles, and San Joaquin. In the latter county I have condemned and had destroyed since June 8, 1893, no less than thirty-four horses and mules afflicted with glanders.

In my own observations on the use of mallein, from the samples sent to me by the Bureau of Animal Industry at Washington, D. C., I find fifteen drops about the right quantity to inject, although I have had very good results with less. When a larger quantity is used the local swelling will be quite large in healthy animals, and some rise in temperature will be noticed. Near the center of the neck or the shoulder is the most convenient place to make the inoculation, where any local swelling can be easily noted. The Bureau of Animal Industry send instructions to take the temperature three times the day before the inoculation, every two hours for sixteen or eighteen hours after, and three times on the following days; but I find it often impossible to give the subject so much time, and I find it quite as satisfactory a way to visit the premises in the afternoon, take the temperature of suspected cases, and inoculate them at 10 o'clock P. M., when of course the temperature is again taken; then at 6 o'clock the next morning, or eight hours after inoculation, and every two hours after until 2 o'clock P. M., at which time the temperature will have risen to its maximum.

Local swelling begins as early as one hour after inoculation, and the

temperature in most cases will begin to rise in from four to eight hours. The time that pyrexia begins, or that swelling begins, has no value, so far as I know, as a help in diagnosis.

In very advanced stages of the disease, and where the temperature of the animal is above 101° F. at the time of inoculation, there may not always be any reaction. In fact, in one case which I shall report later on, the temperature fell from $101\frac{2}{3}^{\circ}$ to 98° in fifteen hours.

I have not been able to note as much difference, as some have, in the swelling that exists between diseased and healthy animals. In three healthy animals tested by me, the local swelling was two inches or more in diameter in each case.

Besides pyrexia and local swellings, I have noticed dullness and listlessness, with but little inclination to feed. There is acceleration of the pulse and respiration in proportion to the amount of fever. There is frequently an increase in the discharges from the nose and eyes, in which cases I have seen acute symptoms following.

I will now give you, briefly as possible, the results of my experience with mallein.

My first subject was an animal that had been exposed by being in contact with all the animals on the ranch, seven of which had been destroyed, for being glandered, about one month before the subject became indisposed. The symptoms were those of a sub-acute nasal catarrh, with watery discharges from eyes and nose, with weakness and dejection. On this animal twenty-five drops of mallein was used, which was followed by an increase of only 1° in temperature, without any other signs of reaction. No further symptoms developed. The animal was put to work in about ten days, and has been sound and healthy ever since.

On March 22, 1894, another healthy animal was inoculated experimentally, with practically no reaction. The temperature varied but three fifths of a degree in twelve hours.

My assistant, Dr. Eddy, next used the mallein on four yearlings that had been exposed and showed suspicious symptoms. His experiments were somewhat unsatisfactory, for the reason that he had to take the train for home twelve hours after the inoculation, and also because his patients were not tractable. The restraint they had to undergo and consequent nervousness in taking the temperature, more particularly the first time, was sufficient to cause a rise in the temperature of 1° or more. The temperature was taken the evening preceding the inoculation, and every two hours for twelve hours after inoculation, which took place at 7 o'clock in the morning of February 22, 1894. In three instances the temperature rose 2° higher than at time of inoculation, and the other 1° . By not considering the temperature at 5 p. m. the day before the inoculation, the test would be positive, but by comparing the temperature at 5 p. m., twelve hours after inoculation, with that of the previous day at a like hour, we find two without an increase and the other two with but slight increase, viz.: $1\frac{1}{3}^{\circ}$ and $1\frac{2}{3}^{\circ}$.

But, as before stated, I consider the excitement in restraint by haltering and taking temperature sufficient to account for the high temperature on the evening before inoculation, viz.: $103\frac{3}{5}^{\circ}$, $102\frac{3}{5}^{\circ}$, $101\frac{3}{5}^{\circ}$, and $102\frac{3}{5}^{\circ}$.

I next had an opportunity to test nine cases on one ranch in all stages of development. Of these all but Nos. 8 and 9 had been working

at plowing all day, and they were too emaciated to work at all, which will account for the high temperature of the more emaciated ones, particularly No. 3. This animal was suffering from acute glanders and was very thin. The teamster said that he seemed very tired that day. In each case the temperature was taken at the time of inoculation only, 9:30 P. M., March 28, 1894, some three hours after their day's work had been completed.

In one instance fifteen drops of the mallein were injected, and in the others but ten drops were used. The temperature was next taken at 6:30 A. M., March 29, 1894, or nine hours later, and every two hours following until 12:30 P. M., fifteen hours after inoculation, as shown by the following tables:

No. 1. Bay gelding, about twelve years old. Condition fair. Indications of old ulcers that had healed on septum nasi.

Date.	Hour.	Temperature.
March 28, 1894.	9:30 P. M.	100 $\frac{2}{3}$ ° at time of inoculation.
March 29, 1894.	6:30 A. M.	102 $\frac{5}{8}$ ° nine hours after inoculation.
March 29, 1894.	8:30 A. M.	103 $\frac{2}{3}$ ° eleven hours after inoculation.
March 29, 1894.	10:30 A. M.	103 $\frac{3}{4}$ ° thirteen hours after inoculation.

Maximum increase in thirteen hours, 3 $\frac{1}{2}$ °. Local swelling, 3 inches in diameter.

No. 2. Roan gelding. Age, eight years. Ulcers in both nostrils, and sub-maxillary glands nodulated. Poor and unthrifty.

Date.	Hour.	Temperature.
March 28, 1894.	9:30 P. M.	101 $\frac{2}{3}$ °
March 29, 1894.	6:30 A. M.	101 $\frac{5}{8}$ °
March 29, 1894.	8:30 A. M.	102 $\frac{3}{4}$ °
March 29, 1894.	10:30 A. M.	102 $\frac{3}{4}$ °

Maximum increase in thirteen hours, 1 $\frac{1}{2}$ °.

The Bureau of Animal Industry reports that cases of acute glanders with high temperature at time of inoculation do not always react. The following is another instance:

No. 3. Roan gelding. Eight years old. Ulcers in both nostrils. Poor and unthrifty.

Date.	Hour.	Temperature.
March 28, 1894.	9:30 P. M.	105°
March 29, 1894.	6:30 A. M.	103 $\frac{2}{3}$ °
March 29, 1894.	8:30 A. M.	104°
March 29, 1894.	10:30 A. M.	102 $\frac{2}{3}$ °
March 29, 1894.	12:30 P. M.	103 $\frac{1}{3}$ °

Maximum decrease in fifteen hours, 1 $\frac{1}{3}$ °.

No. 4. Gray mare. Twelve years old. Quite thrifty appearance. Old scars on Schneiderian mucous membrane. Had glanders five years. I examined this subject five years before for the disease.

Date.	Hour.	Temperature.
March 28, 1894.	9:30 P. M.	100 $\frac{3}{8}$ °
March 29, 1894.	6:30 A. M.	102°
March 29, 1894.	8:30 A. M.	102 $\frac{1}{2}$ °
March 29, 1894.	10:30 A. M.	104°
March 29, 1894.	12:30 P. M.	104 $\frac{3}{8}$ °

Maximum increase in fifteen hours, 4°.

No. 5. Chestnut gelding. Very old and poor. Sub-maxillary glands swollen. No ulcers. But little discharge.

Date.	Hour.	Temperature.
March 28, 1894.	9:30 P. M.	99 $\frac{3}{4}$ °
March 29, 1894.	6:30 A. M.	101 $\frac{1}{2}$ °
March 29, 1894.	8:30 A. M.	102 $\frac{1}{4}$ °
March 29, 1894.	10:30 A. M.	102 $\frac{5}{8}$ °

Maximum increase in thirteen hours, 3 $\frac{1}{8}$ °.

No. 6. Gray mare. Condition fair. Mucous membrane injected. Discharge from left nostril and eye. Sub-maxillary glands nodulated.

Date.	Hour.	Temperature.
March 28, 1894.	9:30 P. M.	101 $\frac{2}{3}$ °
March 29, 1894.	6:30 A. M.	101 $\frac{3}{8}$ °
March 29, 1894.	8:30 A. M.	101 $\frac{3}{8}$ °
March 29, 1894.	10:30 A. M.	102 $\frac{3}{8}$ °
March 29, 1894.	12:30 P. M.	103°

Maximum increase in thirteen hours, 1 $\frac{3}{8}$ °.

This animal should have been watched longer, as I believe the temperature would have risen higher; but if no better results could be obtained she should have been inoculated again, a day or two later. She stood beside No. 7, that gave a reaction of 4 $\frac{1}{2}$ °.

In conclusion, I wish to call your attention to experiments of others tending to show the percentage of negative results obtained in employing this agent.

Numerous experiments have been conducted, both in the United States and the old countries, with nearly uniformly pleasing results. In 112 cases inoculated by different veterinarians, 66 gave the characteristic reaction. An autopsy revealed the characteristic lesions of glanders in 63 cases. In two, no characteristic lesions could be found. In one, a formation in the lungs which evidenced in its microscopical character the glanders nodule, but which, when applied to guinea-pigs, give negative results. The autopsy upon the 46 that did not react showed no indication of glanders. This would show less than 3 per cent of negative results. Dickerhoff and Lothers instituted further experiments, with the object in view of determining the effect of lymph when used upon horses afflicted with pleuro-pneumonia, rheno-admites, chronic influenza, guttural pouches, sarcoma of same, etc. None of the animals in the trials were affected by the mallein, and no horse free from malleis exhibited fever reaction, even when receiving three doses of the mallein.

The April number of the "American Veterinary Review," quoting from the "Veterinary Record," reports as follows: "The required test appears to have been discovered in mallein. The employment in subcutaneous injections on 4,450 horses was followed in 562 instances by the characteristic rise in temperature. These 562 animals were slaughtered, and the necropsies revealed unmistakable evidence of the presence of glanders, the existence of which could not possibly have been suspected ante-mortem. In only four cases did the test fail."

This, gentlemen, is the extent of my experience with mallein, and to me it is very satisfactory indeed. I have now become familiar with its use, and in the future I can overcome any of the little discrepancies that I have heretofore met with. By post-mortem examinations I will be able to more conclusively prove that mallein is an agent of inestimable value in the diagnosis of this insidious disease.

Gentlemen, I thank you for your courteous attention.

SANITATION.

By W. W. OATES, Architect, and Inspector of Plumbing and Drainage for the Stockton Board of Health.

From the standpoint of a plumbing inspector, I have been requested to read a paper before this convention. No apology will be necessary at this time, for it will be taken into consideration that writing articles is not the forte of an inspector of plumbing, unless, indeed, he be thrown into daily contact, as we are, with such a one as our honorable President here, who has a happy faculty of dealing with sanitary subjects as stock in trade, in which case it might act as an inspiration. I consider it a great honor to contribute my mite to the object for which this convention is in session. I do not know that the impressions of an inspector of plumbing will reveal anything new to those who, in their interest for the welfare of humanity, have spent years in observation and study of the theories of sanitation; my object then, will be to confine myself to a few thoughts concerning public sewers, house drains, and fixture drains, impressions that have forced themselves upon my mind during a previous experience in the service of a Board of Health. I do not pretend to say to what extent the public health depends upon the condition of sewers and plumbing appliances of our dwellings, factories, and other places, but it is sufficient that the medical world recognizes it to be a fact worthy of much attention, that the vapors and noxious gases arising from the putrefaction of the contents of vaults, cesspools, and sewers are positively injurious to health and conducive to disease. We often meet with proofs that badly-drained and filthy localities are unhealthy ones. It has been stated as a leading principle in the sewerage of cities, towns, and dwellings that "no method of getting rid of human excreta and household waste matters, solid and liquid, can be considered satisfactory which does not provide *against* vitiation of air, contamination of soil, and pollution of drinking water, the most perfect system being that which will provide for the complete, immediate, and rapid removal of all waste matters susceptible of decomposition."

Underground conduits, termed sewers, are most used and accepted as efficient means of immediate disposal of waste matters. A further improvement may be referred to at this time, known as the "separate system," which nearly, if not quite, solves the problem set forth in the above quoted fundamental principle of drainage. I say *if not quite*, not because I have any doubts concerning the correctness of the principles involved in the "separate system," but to take the opportunity to speak of an evil connected with this class of improvements, in the light of my text. I am constrained to believe that in our valley cities and towns a most important feature of sanitation is to provide especially against contamination of soil and the consequent pollution of wells. This is accomplished, so far as open vaults and cesspools are concerned, by the abolition of the same, which is generally done (after much consideration) by the municipal authorities in the case, and after the Board of Health

had repeatedly recited to them the evils resulting to those forced to drink water made impure by the percolation of sewage into wells. Bonds are then issued for a system of sewerage; contracts are let for the execution of the work; but here we are much afraid the chain is broken, and the good advice of the Board of Health is forgotten or disregarded. It is now a matter of dollars and cents and "political pull," if I may use the expression. The political influence referred to means appointment of superintendents who *may* or *may not* have the ability, or, sometimes, *even* a general knowledge of the work in hand. The incompetency of the superintendent may be taken advantage of by the "dollars and cents man," better known as the contractor; and who can blame him? He is not working for the good of the public health, nor for his own *health*, either, for the matter of that, but for dollars. The result is readily seen. A saving of cement means a bad joint; a hurried and careless job, so much *labor lost*; the soil all along the line may become saturated, as by open vaults or cesspools, and our *fancied* security a matter of fancy only. This I believe to be a matter of great importance and demands the attention of every one interested in sanitary science—this convention and the State Board of Health in particular—to devise means whereby this evil may be prevented.

In a report of the State Board of Health of Pennsylvania we read, the other day, a statement made by a city engineer that some sewers, laid only within the past ten years, through incompleteness of construction were over one half filled with the surrounding soil that passed through the joints, and, he adds, that some of them, having been taken up, were found to be exceedingly filthy. Sewers in this deplorable state will not stand pressure from either within or without. Good and efficient flushing is out of the question, since by an adequate flush the water is liable to wash the exterior as well as the interior.

The plumbing inspector, however, is not supposed to have any interest beyond the curb line; therefore, we do not propose to attempt enlargement of the subject of public sewers, but simply to place before this convention this *one* weakness in the ordinary process of the construction of them, with the hope of inciting discussion that may result in educating the public mind to the importance of perfectly sound and serviceable sewers. As a matter of fact, the average citizen knows, or rather understands, far too little of the why and wherefore of the many provisions made in plumbing and drainage to protect the public health.

One of the many impressions naturally forcing themselves on our mind in the daily routine of duty, is how to bring the householder into sympathy with what he is compelled to receive and pay for.

Of the numerous works and reports of Boards of Health, in which are many good and practical explanations of the principles of plumbing and house drainage, the public see few, and consequently is actually in ignorance of the simplest devices for protection against foul air from the sewer. The *house drain* we consider an important feature in house drainage. This should always, where possible, be laid outside the dwelling and in as short a line from the sewer to the water-closets as will be necessary for the proper connecting of the other drainage of the building. It should have a uniform fall and be laid in a trench, the bottom of which should be solid, undisturbed earth. At the end of the drain should be placed a cleaning-out cap, making practical inspection from end to end of the drain. Earthenware drains should not be laid

underneath buildings where the drain cannot be covered to a depth sufficient to prevent any danger from settlement and the consequent escape of sewer air.

Every drain laid underneath a building should remain uncovered thirty-six hours, to permit the cement of the joints to harden, and then be filled with water. This test will be sufficient to prove joints to be water tight or vice versa. This house drain should be ventilated by continuing the drain full size to the roof of the building. A constant current will be caused by an intake of air at some point in the public sewer or by an air inlet on the house side of a trap placed at the property line, through the house drain, up and out the ventilating shaft at the roof of the building.

The trap above alluded to, is for the purpose of disconnecting the sewer from the house drain by the water seal which forms the trap. There exists a considerable diversity of opinion concerning this trap. It has been claimed in separate systems of sewerage that the public sewer would be better ventilated by its omission; the manholes of the public sewers becoming the air inlets, and the house-drain vents of all premises, the outlets or ventilators. We have spent much time in considering this subject, and have drawn the conclusion that while in systems not automatically and sufficiently flushed, the omission would undoubtedly benefit the public sewer, and probably lessen stoppages from improper material passing through, yet, on the other hand, it would necessitate the continuation of the house-drain ventilator in many cases to an extremely unreasonable height to carry the foul air of the sewers to a point of safety. We therefore believe it to be in the interest of the householder to retain the trapped house drain; we would add again, that the drain should be as short as possible, in order to have no long reaches under floors or rooms to become foul and necessitate elaborate ventilation.

In reviewing the plumbing practices of many Eastern cities, where Jack Frost is found regularly "at home" each season, and the plumber is virtually "monarch of all he surveys," we see that it is found necessary to make many provisions not required to be made in this land of sunshine. Indeed, California may congratulate herself on the fact that it is practicable in nearly all cases to maintain the drainage of all fixtures, except closets, completely disconnected from the house drain by the use of hoppers, or by traps furnished with an air inlet on the fixture side of trap, located at the junction of the fixture drain and house drain. Thus, the fixture drain pipe is disconnected from the house drain in the same manner as the house drain is from the public sewer. The fixture is then twice disconnected from the public sewer. It is rulable in Stockton that where these conditions can be carried out, and the fixture drain pipe be not over fifteen feet to the disconnecting trap or hopper, to omit trap ventilation, on the proposition that the decomposition that may take place in fifteen feet of fixture drain pipe, not exceeding two inches in diameter, will be so small that the fixture trap will be a sufficient guard against the entrance of foul air. This rule does not, however, permit the connecting together of several fixture drain pipes without the trap vent, because of the liability to siphonage of one another. The possibility of accumulation of foul air is lowered, at any rate, to a minimum in this manner of dealing with fixture drains.

TUBERCULOSIS; ITS COMMUNICABILITY AND PREVENTION.

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Permit me to submit for your consideration the following facts, conclusions, and suggestions relative to the communicability and prevention of tuberculosis.

A belief in the contagiousness of phthisis has a very ancient historical foundation in some parts of the world, as pointed out by Dr. Peterson, district physician in Copenhagen, who sums up the results of his inquiries as follows: "(1) That a contagious origin of some causes of phthisis cannot on sufficient grounds be denied. (2) That phthisis caused by contagion is in general of a very dangerous and inflammatory character; that it must be justly considered hazardous to sleep in a non-disinfected bed of a phthical patient, and to be habitually in too close contact with such a person; and that this danger, in Denmark, seems to be greatest in the warm period of the year."

Morgagni writes, in 1868: "In Italy consumption has been and still is looked upon as a communicable disease. A consumptive is shunned, and the vessels he may use in eating and drinking are avoided or destroyed, and his clothes burned or buried."

The opinion that long and continuous exposure to the body effluvia of a tuberculous patient puts a non-tuberculous person to the risk of the disease, by a predisposition to it, has been held by Joseph Franks Laënnec, Sir James Clark, and others. Although Sir Thomas Watson explicitly states that he does not believe phthisis to be contagious, nevertheless, for obvious reasons, dissuades the occupation of the same bed, or even the same sleeping apartment, by two persons, one of whom was known to labor under pulmonary consumption.

Dr. Fuller says: "But though the non-infectious character of phthisis be admitted, it behooves the physician to warn the patient's friends of the danger incident to a long-continued attendance on him, especially if the disease be in an advanced stage. It would be the height of imprudence for a healthy person, and especially if young and of a scrofulous diathesis, to sleep in the same bed, or even in the same apartment, with a consumptive patient; for although the malady might not be communicated directly from one to the other, unless possibly under the condition of some tuberculous matter being accidentally introduced into his air passages, or into some other part of his system, the surroundings and the air would be calculated to predispose him to the disease."

Regarding the possible contagious propagation of pulmonary phthisis, Dr. Parker thus expresses himself (having regard to the fact that purulent and epithelial cells have been demonstrated as floating about in the air where numbers of people are together): "Considering that the pleuro-pneumonia of cattle is probably propagated through the pus and epithelial cells of the sputa passing into the air cells of other cattle;

that even in man there is some evidence of a pneumonic phthisical disease being contagious, the floating of these cells in the air is worthy of all attention. It may explain some of those curious instances of phthisis being apparently communicable."

Dr. Villemin suggests "that besides the direct transmission, as by cohabitation, consumption may be contracted through indirect means: by clothes, bed linen, water-closets, the vitiated air of rooms lived in by tuberculous persons, etc." The possible transmissibility of the disease in this manner merits, he thinks, the attention of medical officers of the army. A tuberculous soldier dies in the hospital, and his clothes are returned to his company and worn by another. May not this, he asks, be one source of phthisis in the army? He is satisfied that the barracks is to the soldier, in the production of consumption, what the regimental stable is to the horse in the development of farcy, the contagion and transmissibility of which are at length accepted.

Fournet, who in his work is a non-contagionist, still gives some weight to the "possibility of infection from an atmosphere constantly breathed, and necessarily poisoned, by the consumptive."

Dr. Jules Guerin believes "that crude tubercle can never be contagious, but that when it is softened and the ulcerated lung surfaces are exposed to the air, the patient may become a source of infection to those about him." Just as the pulmonary lesion he has may infect his own organism by resorption of putrid and purulent products.

Dr. Bouillaud says: "During the course of pulmonary tuberculosis, when pus or other products are formed in parts which are accessible to the atmosphere, phthisis, like so many affections in which similar purulent foci happen, becomes indirectly a cause of septic infection."

So much for the opinion of medical men regarding the contagiousness of consumption previous to about 1870. Since then many investigations regarding this matter have been carefully conducted, with the following results and convictions:

It has been proved that rabbits are not infected by association with diseased rabbits, because rabbits do not *expectorate*.

Of one hundred nurses deceased (from statistics based on a record of 87,000), sixty-three died of tuberculosis. It is those especially who dust rooms, make beds, and have charge of the wash that are most exposed.

"Orphan asylums under perfect prophylaxis show no tuberculosis."

"Neuremberg's orphan asylum, with four hundred children, has had but two or three cases of tuberculosis in eight years."

"As to kissing, it is confessed that the disease may be so carried, but not then directly to the lungs, but to the glands about the mouth and neck, to constitute scrofula. Children are especially thus endangered. In hundreds of experiments the lymph-glands nearest the point of infection are affected first. Thus, infection from the mouth, nose, ear, anywhere on the right side, is followed by infection of the glands on the right side. The left remain sound for eight weeks, when they, too, are affected, but the point of infection can always be ascertained with absolute certainty."

"The milk of tuberculous cows was infected in 55 per cent of cases. Milk taken from the healthy udder of a tuberculous cow, diluted definitely with water, injected intraperitoneally into guinea-pigs, lost its virulence; in one case in a dilution of 1 : 40, in another 1 : 50, and in a third 1 : 100. Milk is rendered less dangerous by admixture with other

milk; for the advancing disease in one cow increases the virulence of its milk, while dilution with milk of other cows lessens its virulence. Continued use of so-called warm milk from one cow should be abandoned utterly."

"The dilution of sputum 1:100,000 does not affect its virulence, whether introduced into the body subcutaneously by intraperitoneal injection, or by inhalation. On the other hand, feeding of 32 minims in a dilution of 1:8 gave no positive results."

"In experiments made with pure cultures, positive results were obtained with a subcutaneous injection of 16 minims of a dilution 1:400,000; also with an inhalation of 80 minims of the same dilution beef-peptone-glycerine-agar culture. Pure cultures, therefore, do not lose virulence in a dilution of 1:400,000."

"The subcutaneous tissue, the peritoneum, and the lungs proved about alike favorable to the reception and the multiplication of the tubercle poison, while the intestinal tract was much more resistant; and it was evident that the poison in minimum quantity would not at all affect certain organs. Thus, in intraperitoneal injection, the peritoneum remains perfectly free in two thirds of the cases, while the poison fixes itself and multiplies in the lymph-glands and spleen as much more favorable organs. The sequence of preference is as follows: lymph-glands, spleen, lungs, liver and heart, and lastly, kidneys and genitals."

"After subcutaneous injection an abscess containing bacilli is always formed. The nearest lymph-glands are therefore affected, and later and more slowly the internal organs, especially the spleen."

"After inhalation in more than half the cases the bronchial glands as well as the lungs are found to be affected, and sooner or later the spleen, while other organs, as the liver and peritoneum, remain free."

"The extremely susceptible guinea-pig may remain unaffected by intraperitoneal injections of 16 minims pure culture 1:200,000 dilution; while injection of the same, dilution 1:400,000, may give the positive result in another animal. It is thus shown that milk may be infectious when the scanty bacilli are undiscoverable by the microscope. So that the negative evidence in the examination of sputum does not exclude the disease."

"The finest and truest test is inoculation. The extent and intensity of infection depend directly upon the number of germs introduced."

"Careful and long-continued observation seems to show that the meat of tuberculous animals does not necessarily convey the disease."

Experimental evidence as to the infective character of such flesh varies.

Kastner concludes that the result obtained supports the view that no great amount of danger is to be feared from eating the flesh of tuberculous cattle, unless the tuberculous disease has formed nodules in the flesh—a very rare occurrence. He would, however, boil the meat of such cattle before use.

"Steinheil, experimenting with human flesh, using the psoas muscle of patients who had died of tuberculosis, injected sixteen guinea-pigs, of which fifteen contracted tuberculosis." Steinheil is of opinion that the lungs are the organs from which the infection is carried to the flesh.

"Infection by the alimentary canal occurs usually through fluid food—milk."

The owner of a valuable herd of cattle, finding a large proportion of them were tuberculous—so large a proportion as strongly to suggest infection by association in the sheds—withdrew his milk from market and used it without boiling for fattening his pigs, of which he had a large lot, and on which he prided himself not less than on his cows. The result has been that the pigs have almost without exception been affected with the disease to an extent that has necessitated the slaughter of the whole stock. “Another point of practical interest is that he was not able to discover nodules or other indications of localized tubercles in the cows’ udders—a condition still held by some to be necessary to render the milk capable of transmitting the disease.” Hence all milk should be boiled.

“The almost universal conviction seems to have been established that tuberculosis pulmonum is caused exclusively by the inhalation of dried sputum.”

This, the original postulate of Koch, met its conclusive proof in the studies of Cornet, under his direction. “We know now,” says Cornet, “that tuberculosis is caused in the great majority of cases by breathing the dried and pulverized sputum of consumptives. Those persons, therefore, who have to attend daily to the cleansing of rooms and making of the beds of consumptives, and to the removal and cleansing of handkerchiefs and other cloths which have been used as receptacles of the sputum, are more in danger than others of inhaling the bacilli and thus infecting themselves. Therefore, as we have seen, the greatest number of infections occur in these years; with increasing age this work falls upon younger and stronger shoulders, and the danger of infection is largely avoided, for it is not the breath of the consumptive, not the residence in the hospital, which is dangerous, but simply and alone the inhalation of the dried sputum which is mixed with the dust of the floor and the bed, and which, particularly in the morning bed-making and cleansing, is whisked into the air where it is likely to be breathed; we cannot wonder, therefore, that the older members, although they still remain at their duties as attendants upon the sick, are no longer infected so frequently as are those of younger age.”

One writer states the tubercle bacilli live in dried sputum one hundred and eighty-six days and the hardy spores often retain life much longer.

The propagation of phthisis in children by means of milk from tuberculous cows most certainly claims serious attention. What part of the appalling percentage of children who die before reaching the age of five years from the effects of the ingestion of milk from tuberculous cows, we will probably never be able to determine, but that it is extremely large seems hardly to admit of doubt. It need not necessarily establish well-marked organic infection to result in a fatal termination. The presence of the bacilli in the extremely sensitive intestinal mucous surface intensifies what would otherwise prove a comparatively harmless enteritis, and without nodules or caseous degeneration may succumb. Foster found that the bacilli of tuberculosis live in milk at least ten days.

“As a result of the investigations of Cornet, the question of inheritance sinks in value more and more; so that while it may be admitted in exceptional cases of internal tuberculosis, it may be probably rejected altogether in the case of phthisis pulmonum.” In one set of experiments Sanchez-Toledo injected pure cultures of Koch’s bacillus into the

jugular vein of pregnant guinea-pigs, but neither in the blood nor in the organs of the fœtuses was he subsequently able to detect any trace of the microbe. Similar negative results followed experiments of injections into the pleural sac or beneath the skin of pregnant guinea-pigs, for although the animals themselves became tuberculous their fœtuses were quite free from the infection.

Dr. Brice, of Ontario, in a very able paper on consumption, says: "Popular and professional opinion have both accorded to heredity the principal existing cause, but the most scientific teachings of the present day are that all that is inherited is a tendency due to imperfect development, not of organism in its gross and composite form, but in the structural or cell elements of its tissues. It will be manifest that if the delicate mother has a child weak at birth, it is probable, in the very nature of things, that it will be imperfectly nourished by her, and the innate tendency will be rather developed than lessened. That this is true seems to be borne out by the fact of the enormous number of children dying within the first year or two of birth from tuberculosis of the intestinal tract and neighboring glands."

Quoting from Dr. Roosevelt, in a paper read before the New York Academy of Medicine, February 4, 1892: "Whatever other predisposing or possibly necessarily concomitant factors make possible the terrible misery produced by it, there can be no doubt that pulmonary phthisis would not and could not exist were we able to destroy the bacillus tuberculosis. Hereditary or acquired vulnerability doubtless plays a large part in preparing a fit soil; environment and habits of living—in fact, any number of diverse forces, acting singly or together, may operate in producing phthisis; but it may be safely said that the one primary cause of the dreadful disease is the bacillus of Koch. Without tuberculosis there is no phthisis, and without the bacillus there is no tuberculosis."

"There seems no doubt but consumption is caused by a living, rod-like germ, about $\frac{1}{8000}$ to $\frac{1}{12000}$ of an inch in length and with a breadth $\frac{1}{4}$ to $\frac{1}{10}$ its length. These bacilli multiply by division and also by the formation of spores. Division and sporulation take place slowly, and thus colonies are of slow growth. These bacilli are also difficult of cultivation, because they will only grow in certain media and in the presence of a certain amount of moisture. They do not form spores in the air. The bacillus thrives only within a certain range of temperature—from about 95° to 105° F.; and though they may not be at once killed by temperature above or below this range, they are rendered inactive and incapable of multiplication. They are destroyed by heat over 250° F. A temperature of 107.5° F. continued for several weeks produces the same result. Their growth ceases below 82° F., but cold does not appear to kill the bacillus."

"The most important characteristic of these bacilli is their power of producing tuberculosis in susceptible animals, and this with unerring certainty, whereas the disease is not produced when the bacilli are absent. When they are introduced under the skin or within the cavities of the body, tuberculosis is the invariable result, starting at the point of inoculation and spreading usually along the line of the lymphatics. Finding lodgment in the lungs through inhalation, they produce inflammation, poisoning, and death of the tissues, and consumption is established. These bacilli retain their virulence during months of dry-

ing, and are found alive after long burial in the earth. Professor Koch found light as potent a poison for tubercle bacilli as chemicals, sunlight killing a layer of tubercle bacilli in a few minutes or hours, according to the thickness of the layers. Ordinary daylight will exercise the same effect in from five to seven days."

Dr. Prudden says: "By far and away the most common and abundant lurking place of this germ is the sputum in pulmonary tuberculosis. When the tubercle bacilli are cast off from the body in the sputum they are closely imbedded in a moist, tenacious, albuminous material, from which they cannot escape so long as moisture is maintained, no matter where they lodge or what air currents may blow over them. So that so far as specific contamination of the air is concerned, this cannot occur while the sputum remains moist. This same tenacious envelope also prevents such ready access of disinfectants to the bacilli in the sputum as would assure their easy destruction. When the sputum dries the bacilli are still firmly held in place so long as the desiccated mass remains intact. But let this once be pulverized by the foot, on floor or carpet, by rubbing between folds of cloth, or in any other way, and these virulent particles can mingle at once with other dust and become subject to the same physical laws of transport and diffusion. It is to be distinctly understood that the breath of consumptives, apart from solid particles which may now and then be cast off in coughing, conveys no germ."

"That there are many contributory factors in the acquirement of this disease—vulnerabilities of the individual both hereditary and acquired, predisposing vicissitudes of environment—one cannot, it seems to me, deny, nor should he measure lightly. But the one thing without which tuberculosis cannot come to man or beast, is the living tubercle bacillus. All the vulnerabilities and predispositions and favoring vicissitudes which we either know or can conceive of, cannot, without this particular germ, light up this particular disease. It is not a vapor in the air, it is not a mysterious enzym which does this thing, but a definite physical body which we can see and measure with our lenses; which we can cultivate, and handle, and kill."

"The evidence of the communicability of tuberculosis finds a most dramatic index in the yearly death roll of its victims. Slowly but surely we have learned that what was once thought to be hereditary transmission of the disease, is often only household poisoning, or at most an entailed vulnerability in the presence of the germs, derived from whatever external source. The possibility of extremely infrequent direct hereditary transmission of the tubercle bacillus need have no serious consideration here."

That tuberculosis is infectious, communicable, preventable, admits of no doubt.

Dr. Squire, of London, writes: "The tubercle bacillus has been found in the air of rooms in which phthisical persons are living, and the dust from such rooms has been proved to be infective. I have recently had some glass slides covered with glycerine placed about the wards of the consumptive hospital to which I am attached, and there left for a few days, so that the dust settling from the air might be caught and held by the glycerine." Subsequent microscopical examination of these slides demonstrated the presence of tubercle bacilli derived from the air of the wards."

Dr. Northup writes: "To test the penetrability of the bacilli through the mucous membrane of the mouth of the guinea-pig, Wyssokowitz, of the University of Charcow, rubbed into the mucous membrane of the mouth, having first cleared away all particles of food, tubercular sputum rich in bacilli. By means of a cotton pledget wound upon the end of a sound, he rubbed the sputum into the wall of the pharynx for from one half a minute to two minutes without injuring the membrane; at least, without drawing blood. After twelve days he noted one pea-sized glandular swelling in the neck; on the twenty-fifth day, three swollen glands, and on the forty-fifth day the animal died. On autopsy was found the following: Five lymph-nodes enlarged from the size of a pea to that of a bean, partially or wholly cheesy. There were no other tubercles in the body; the intestines and mesenteric glands were unchanged. Tubercle bacilli were present in all the nodules and cheesy masses." To quote literally a point of interest just now, he says: "But the case aroused the greatest interest for this reason: that even by the most penetrating examination no local change could be demonstrated—either ulceration or thickening or induration—either upon the surface or deep in the mucous membrane of the throat or larynx or in the neighboring part."

Tubercle bacilli enter the respiratory passages with the inspired air, lodge in the mucus of the air passages or the alveoli of the lungs; they may pass through the mucous membrane at any point, be taken into the lymph-spaces, traverse the lymph canal to the nearest nodes, and be retained. Their subsequent career depends upon the power of the tissues to withstand their tendency to grow and reproduce the lesion in which they were bred. According to this power of resistance, they will die or remain inactive for a long period, or will develop nodes known to be scrofulous (on the authority of Wyssokowitz), or may lead on, when the powers of resistance are depressed, to rapidly fatal tuberculosis.

Let us consider briefly a few very probable sources of infection: On the sidewalk of one of the principal streets of the city sits an emaciated consumptive. From broken-down tuberculous lungs, frequent and profuse expectoration is deposited on the pavement. A woman with petticoats sweeping the walk passes along and with careless indifference at least one purulent mass is successfully removed. Arriving at home the skirt is hung in the wardrobe and remains undisturbed several weeks; then it is taken out and dusted for wear again. An only child, a beautiful girl of five years, watches with childish curiosity the process of dusting, inhales the bacilli, and in a few months a physician is consulted for the child's bad cough, which proves persistent, progressive, fatal, and a home is left desolate because a man known to have consumption was allowed to deposit the germ of a disease known to be highly communicable and generally fatal in this manner—a disease which, in this country, in 1890, swept more than 135,000 human beings into premature graves; a disease which, in England, in the twenty-five years ending in 1886, has numbered its 50,000 victims annually; a disease whose prevention, in a great majority of cases, is as certain as its existence.

A faithful servant girl afflicted with phthisis is retained in a family long after the establishment of profuse purulent expectoration—the breaking down of a tuberculous lung. Ignorant of the nature of the malady the children are allowed to play in her room, and often to sleep with her at night, subject to infection from frequent inhalation of the dust of the room, which, without extraordinary care, cannot escape the

presence of the tubercle bacilli. Emaciation speedily follows, a loss of appetite, and a fatal termination of a case of quick consumption often precedes the death of the girl from whose lungs the infection was given off.

A party of healthy people are crossing the continent by rail from the East. A consumptive occupies the same car, and naturally takes a seat near the fire. He has paid his fare and is certainly entitled to the privilege of spitting if he chooses, and he deposits his sputum near the stove, where it rapidly dries, is ground beneath the feet with other dust, and the party is compelled to submit to an insufflation of diseased lung tissue and bacilli. What wonder that the visit to our golden State did not agree with one or more of the party who "took cold" on the trip, and it ran into consumption, and they died within a year!

Living, loving, ignorant lips kiss the infection from the dying tuberculous, and their doom is sealed, and "The Lord gave and the Lord hath taken away" stands a holy substitute for apathy, carelessness, and ignorance.

"Dr. Dobnolonski, of St. Petersburg, found, after experiments with animals, that tubercle bacilli can infect the organism through the digestive tract without previous lesion, either desquamation or inflammation. Tubercle virus as well as spores can traverse easily the perfectly normal intestinal wall; the contact need not even be prolonged."

Regarding the universality of this terrible pestilence, Dr. Janeway says: "If we were to consider that if we had been able to enumerate the number of persons in New York City with phthisis, at any time during 1890, 16,000 would not have been far from right."

Among 1,000 autopsies, Osler found 275 with tuberculosis; among 8,873 patients in the surgical clinic at Wurzburg, 1,227 were tuberculous, or one seventh.

"The necroscopic statistics of Harris and others show that one third, perhaps over one half, of the people who live to middle age have some form of tubercular infection. And Dr. Williams, of Johns Hopkins Hospital, estimates that tuberculosis of the female generative organs is four times more frequent than generally supposed."

One death from consumption in every six in our country is a low estimate. Let us see what it means: There is nothing more certain than that all who live must die; hence, of our present population of 65,000,000, almost 11,000,000 must sooner or later die of consumption. And we physicians and sanitarians proclaiming this disease communicable—preventable, but practically incurable!

Now the question arises, what are we going to do about it?

Aided by the strong arm of the law compelling quarantine isolation and compulsory vaccination, the death-rate in England from smallpox has been reduced from 1 in 10 to 1 in 50,000 people.

The prospects of a possible invasion of cholera calls out an appropriation by our State of \$50,000, to be used, if necessary, in its suppression; and the State Board of Health given almost unlimited authority to prevent the invasion and spread of a disease, the germ of which can only be "eaten and drunk"; and yet the report of *two cases* of this disease on the Atlantic coast awakened the continent; was flashed to every city and town, and published in every paper; caused the worthy President of our State Board of Health, Dr. C. A. Ruggles, at that time in Massachusetts, to hasten to the scene of infection in New Jersey, and hastily glean the facts from the Surgeon-General and others repre-

senting other State Boards of Health, called there on the same mission, telegraphed Secretary J. R. Laine. Our State, three thousand miles away, was for the present safe; and all this regarding a disease which, with the financial and legislative aid of our Government, and intelligent vigilance on the part of Boards of Health and careful practitioners, ought never to be allowed to gain a foothold in America; while one hundred and fifty to two hundred deaths from consumption a month in our State awakens little interest, is accepted as a matter of course, and "the mourners go about the streets," and themselves, perchance, contract the disease from some ill wind laden with infected dust which blows no one any good.

Now, are we acting in good faith with that humanity in whose interest we are supposed to labor, to longer postpone action in attempts to suppress and in some degree prevent the terrible ravages of this "pestilence that walketh at noon-day" and at night as well; this pestilence which, under certain conditions, pervades the air and the earth, the meat and milk, that is wafted in the gentle zephyr, that may be snuffed from the rose, that steals into our room when we sleep, and haunts our waking hours unrecognized?

Are our ears not yet made heavy with hearing: "It is strange you doctors do not discover something that will cure consumption"?

Shall we remain in apathy, apparently under the hypnotic influence of that beautiful word painting of Charles Dickens, regarding the death of Smike?

"But there were times, and often, too, when the sunken eye was too bright, the hollow cheek too flushed, the breath too thick and heavy in its course, the frame too feeble and exhausted to escape their regard and notice. There is a dread disease which so prepares its victims, as it were, for death; which so refines it of its grosser aspect, and throws around familiar looks unearthly indications of the coming change—a dread disease in which the struggle between soul and body is so gradual, quiet, and solemn, and the result so sure, that, day by day, and grain by grain, the mortal part wastes and withers away so that the spirit grows light and sanguine with the lightening load; and, feeling immortality at hand, deems it but a new term of mortal life—a disease in which death and life are so strangely blended that death takes the glow and the hue of life, and life the gaunt and grisly form of death."

Shall we, standing in the bright light shed on the etiology of this disease by scientific investigators in all parts of the world to-day, remain reconciled to its existence and put forth no effort to stay its mighty ravages?

Shall we remain silent, indifferent, and apathetic when we know that a very large portion of consumption's levy of 135,000 human lives every year in our country can certainly be saved?

The State Board of Health of Michigan has wisely placed consumption on the list of infectious diseases dangerous to the public health. Other Boards of Health are taking steps in this direction. A resolution to the same effect is presented to this convention for action. I doubt not it will receive your hearty indorsement.

The earliest possible recognition of the bacilli in the sputum seems imperative. Hence a microscopical examination of the sputum should be made immediately a suspected case of consumption is called to notice.

That this action will have a tendency to make practitioners more careful and certain, if possible, in their diagnoses of tuberculous patients, need not interfere with the carrying out of this suggestion.

The specific legislation that will best aid us in the suppression and prevention of consumption, is not easily outlined.

That consumptives in State institutions should be segregated and strict attention given to the destruction of the bacilli in any manner given off, seems evident to all.

That indigent, homeless, irresponsible victims of phthisis be required to deposit their excretions and secretions in certain prescribed receptacles, and never allowed to spit in the streets, I believe possible of accomplishment.

That the immediate, literal destruction of any animal proved to be infected, is not requiring too much.

That all rooms, hotels, lodging or private houses, in which death has occurred from consumption, or which has been occupied by a consumptive, be required to be thoroughly disinfected, under the immediate supervision of the local Health Officer, appears urgent and indispensable necessary.

Under the new order of things herein suggested, all delusions of phthisical patients by physicians who, from consideration of policy, or to spare the delicate feelings of their patients, make the statement that theirs is a case of bronchitis simply, will be done away with. However unpleasant and unwelcome the truth may prove in some instances, we believe that only in exceedingly rare cases will it be productive of harm.

That no legislative measures be advocated or employed which shall work hardship, oppress in any way the unfortunate, or offend the sentimentality of reasonable minds, we probably all agree.

Much of the senseless traveling of consumptives will be stopped, and changing of climates will less frequently be advised.

Indeed, since the communicability of consumption has been suggested, it is interesting to note the disinclination on the part of all localities for proclaiming their particular section a paradise for consumptives.

To even suggest to the profession that the duty of educating the masses regarding the communicability of consumption and contributing toward its prevention devolves upon it, appears superfluous and unnecessary. Already all over our land physicians devoted to their calling, anxious to render the best possible service to the race, have had printed at their own expense instructions for the education of the public, and have taken every opportunity to herald this new gospel of salvation. One feels sadly out of place and very ill at ease in attempting to outline to *such* a course of action; but to those who have not interested themselves in this matter we believe it proper to suggest that never in the history of the human race has the conscientious physician felt himself called upon as now to put forth strenuous efforts to stay the progress of this mighty avalanche of woe which has so long held the right of way undisputed.

THE SANITARY CONTROL OF TUBERCULOSIS.

By S. S. HERRICK, M.D., of San Francisco.

The bacillus tuberculosis as the causative agent, and the infectious nature of the various tubercular maladies, are assumed as settled. As to heredity, it is now about time to conclude that this figures mainly, if not entirely, as a predisposing condition. We may also dismiss endemic influences as causative, however much they may affect the prognosis of tuberculosis. There can be no climatic exemption of the inhabitants of Iceland, the Faröe, Shetland, and Hebrides islands, while the same race is scourged by pulmonary phthisis in Scandinavia. Moreover, the Eskimaux have escaped, for the simple reason that they have not been visited by phthysical voyagers.

A few instances, on the other hand, illustrate how certain localities become and remain deadly to their occupants, from constant subjection to the presence of tuberculous emanations in a confined atmosphere. In a certain office in Paris, during eleven years, fifteen out of twenty-three clerks died of tuberculosis. Cornet states that nearly 63 per cent of the deaths among the religious orders devoted to the care of the sick in Germany have been due to tuberculosis; and that in the Prussian prisons, for fifteen years, nearly 46 per cent of the male prisoners died of phthisis. It is certain that the huts of the Eskimaux have no sanitary advantage over these civilized abodes, except absence of tubercular infection. Dr. Flick's observations in Philadelphia during twenty-five years show that many of the houses in the fifth ward had six to eight deaths from this disease, and that over one third of the houses where deaths occurred had more than one case. He states that, during his residence at Blockley Hospital, two out of fifteen of his associates died, and he himself was thought for a time to be a victim, of pulmonary consumption.

The fact that the general progress of curative medicine has failed to reduce materially the fatality of these maladies, which still carry off more than 10 per cent of all who die, proves the necessity of prevention rather than cure. The chief danger exists in the products thrown off from the diseased organs; that is to say, the sputa from affected lungs, the alvine discharges from intestinal tuberculosis, the discharges from scrofulous ulcers, the natural secretions of diseased glands. The sputa of consumptives are more mischievous than all the rest. We know now how these carriers of infection must be dealt with, so as to render them innocuous without serious trouble. It is quite practicable for every affected person within doors to deposit infectious matters in a disinfecting liquid, and when abroad to carry a small receptacle similarly charged; or pieces of thin, unsized paper might be used and then burned.

In the light of knowledge now the common property of the medical profession, and largely shared by intelligent people throughout the civilized world, the time is at hand for our sanitary authorities to act

in this matter. The State Board of Health of Michigan set the example at its meeting held in October, 1893, when the following was adopted:

Resolved, That hereafter consumption (and other diseases due to the bacillus tuberculosis) shall be included in the official list of "Diseases Dangerous to the Public Health," referred to in Sections 1675 and 1676, Howell's Statutes, requiring notice by householders and physicians to the local Health Officer, as soon as such a disease is recognized.

The explanation is added: "The question of isolation of the patient is not mentioned. Its purpose is to secure to the local health authorities and to the State Board of Health information of the location of each case of this most dangerous disease, with the view of placing in the hands of the patient reliable information how to avoid giving the disease to others, and in the hands of those most endangered information how to avoid contracting this disease."

In December last, Dr. Herman Biggs, of the Health Department of the city of New York, made a report, which embodied these recommendations:

"1. That a circular be prepared for distribution among the people, setting forth the danger of contagion from tuberculosis, and the fact that the discharges from the lungs of tuberculous patients are not only dangerous to others, but also to the patient afflicted; and also setting forth the danger of expectorating in places where the sputum is liable to be dried and carried by the air in the form of dust.

"2. That physicians and other persons to whom the knowledge of the existence of a case of tuberculosis may come, be requested to report to this department all such cases within seven days of the time when such person comes under observation.

"3. The medical sanitary inspectors should, as a part of their duty, investigate doubtful cases of the disease reported and take specimens of the sputa for diagnostic purposes, the same as is done in cases of diphtheria. These specimens should be transmitted to the Division of Bacteriology for examination, and the Division of Bacteriology should be properly equipped for such examination for the purpose of obtaining definite knowledge upon which the proper sanitary *surveillance* of those suffering from tuberculosis can be based. Upon the verification of the diagnosis, the inspector should visit the physician reporting each case, and request him to fully instruct his patient and the persons with whom he is in contact, concerning the nature of the disease and the danger of its transmission. If the case be reported by laymen, or if the physician prefers that the inspector should assume the aforesaid duty, then the inspector should personally perform this service."

Also: "That this Board urge upon hospital authorities of the city of New York the importance of separation, so far as possible in the hospitals of this city, of persons suffering from pulmonary tuberculosis from those affected by other diseases, and urge that proper wards be set apart for the exclusive treatment of this disease."

And "That the Commissioners of Charities and Corrections be recommended to take such steps as will enable them to have and control a hospital, to be known as the Consumptive Hospital, to be used for the exclusive treatment of this disease; and that, as far as practicable, all inmates of the institutions under their care suffering from tuberculosis be transferred to this hospital."

Likewise it was recommended that the department provide disinfect-

tion in suitable instances, and that proper cuspidors be provided in public places, factories, etc.

It having transpired that the Board of Health of Philadelphia had this subject under consideration, the College of Physicians, at its meeting January 12, 1894, took it up, as proposed by its council, in the following terms:

Resolved, That the College of Physicians believes that the attempt to register consumptives and to treat them as the subjects of contagious disease, would be adding hardship to the lives of these unfortunates, stamping them as the outcasts of society. In view of the chronic character of the malady, it could not lead to any measure of real value not otherwise attainable.

That strict attention on the part of physicians in charge of the individual cases, insisting on the disinfection of the sputum and of the rooms, on adequate ventilation, and on the separation of the sick from the well, as far as possible, will meet the requirements of the situation so far as they practically can be met, and better than any rules that, for diseases so chronic, can be carried out by Boards of Health.

That the College of Physicians respectfully requests that no official action be taken by the Board of Health, except the insisting on disinfection of rooms in which consumptives have lived and died in instances in which such procedure is not likely to have been adopted under the direction of the attending physician.

The following substitute was offered by Dr. L. F. Flick:

Resolved, That we recommend to the Board of Health of the city of Philadelphia the registration and disinfection of houses which have been infected by tuberculosis.

That we recommend to the City Council of the city of Philadelphia the establishment of a municipal hospital for the treatment of persons suffering from tuberculosis.

After thorough discussion of the whole subject the substitute was rejected, and the original resolutions adopted.²

In the course of the discussion allusion was made to resolutions adopted at the late meeting of the American Public Health Association at Chicago, asking that registration should be practiced; also to similar action taken in the Section on Hygiene of the Pan-American Congress of 1893, and by the Congress of Tuberculosis at Paris in 1888 and 1891. Dr. Flick stated that under the precautions taken at Berlin, between 1884 and 1891, the mortality from consumption declined from 3.455 per 1,000 of population to 2.811, or .644 in seven years; while in Philadelphia the reduction was .623 per 1,000 in ten years; and in Paris the mortality remains about the same as it was thirty years ago from this disease—4.574 per 1,000. In England instructions have been published, to inform consumptive patients how to avoid dissemination of the infection, by the North London Hospital for Consumptives, the Royal National Hospital for Consumptives at Ventnor, the Manchester Hospital for Consumptives, and the County Borough of Oldham. The Medical Officer of Health of Manchester offers to disinfect gratuitously any house designated by a qualified medical man. The French "Ligue Préventive" has issued instructions to guard against danger from tubercular infection. In Germany disinfection is compulsory in houses where deaths occur from pulmonary consumption.

History repeats itself, and the wise man of old declared: "There is nothing new under the sun." Apropos of this point, Dr. Flick has recalled an extremely interesting experience in Southern Italy.³ In the year 1782 the following regulations were established in the Kingdom of Naples:

"1. That the physicians shall report the consumptive patient, when ulceration of the lungs has been established, under penalty, for the first, of 300 ducats, and, upon repetition, of banishment for ten years.

"2. That an inventory shall be made by the authorities of the clothing in the patient's room, to be identified after his death, and if any opposition shall be made, the person doing so, if he belongs to the lower class, shall have three years in the galleys or in prison; if to the nobility, three years in the castle and a penalty of 300 ducats.

"3. That the household goods which are not susceptible shall be immediately cleansed, and those that are susceptible shall be at once burned and destroyed.

"4. That the authorities themselves shall tear out and replaster the house, alter it from cellar to garret, carry away and burn the doors and wooden windows and put in new ones.

"5. That the poor sick shall be removed to a hospital.

"6. That newly built houses cannot be inhabited before one year from their completion, and six months after plastering and repairing have been done.

"7. That Superintendents of hospitals must keep in separate places clothing and bedding for the use of consumptives."

Other severe penalties were denounced to those who buy or sell objects which had been used by consumptives to servants, members of the family, and to any others who may violate the regulations. The destruction of property and enforced vacation of houses newly built or repaired for six or twelve months were unnecessary, but the segregation of the sick and the disinfection of all articles defiled by sputa were wise provisions. The law remained in force until the amalgamation of Naples and Sicily into the Kingdom of Italy in 1860, but it is not probable that it was strictly enforced, as some of its provisions were unreasonable and harsh.

The testimony of writers toward the end of the eighteenth century indicates that tuberculous diseases were more prevalent in the Neapolitan dominions than elsewhere in Europe, and their mortality is estimated by Dr. Flick at 10 per 1,000 of population in 1782. In 1834 they were reported about as prevalent at Naples as at London and Paris, but in 1848 De Renzi declared that their ravages had greatly abated, though the restrictions had been somewhat relaxed. There is evidence that the mortality from phthisis in Naples was 4 per 1,000 per annum in 1834; but in 1887 it had declined to 1.16 from phthisis and general tuberculosis in the urban population of the Neapolitan territory, while in the same population for the rest of Italy it was 2.20 per 1,000. This decline is the more noteworthy from the greater prevalence of tubercular diseases in the Neapolitan dominions than elsewhere in Italy when the law went into effect, and from the fact that Southern Italy has been largely resorted to by consumptive invalids. Notwithstanding the repeal of the restrictive law in 1860, it is probable that its essential features are still observed as a matter of custom.

But it should not be presumed that the contagious nature of pulmonary phthisis was first suspected in the eighteenth century. Hippocrates supposed heredity to figure in its causation, and was silent on its contagiousness; but contagion is ignored in all his works which have come down to us. On the other hand, Isocrates, his contemporary, speaking of empyema (evidently meaning pulmonary phthisis) indicates that it was then considered contagious. Aristotle and Galen seem to have shared this opinion. Lommins (writing in 1563) regarded phthisical sputa as contagious. Dr. Richard Morton, at the beginning of

the seventeenth century, asserted that consumption may be contracted from a bedfellow, like a contagious fever. Morgagni (1760) expressed his fear of dissecting bodies dead of this disease, on account of its contagious nature. Indeed, Tanner⁴ asserts that, until about 1790, pulmonary phthisis was generally considered contagious. From that date its contagious property rapidly went into discredit until the discovery of the bacillus tuberculosis.

From the foregoing it is manifest that the control of tubercular diseases is a question which this convention should take under serious consideration at the present meeting. In my judgment, the State Board of Health and the local Boards of our State cannot long delay action, and must soon decide upon some line of proceeding. As to the propriety of the health authorities, both State and local, disseminating among the population printed instructions for destroying the sputa and all other discharges containing the tubercular bacilli, there can be no question; nor as to their duty to disinfect apartments and houses whenever requested to do so by the occupants. Further action, looking to the registration and supervision of cases, seems to require legislative authority. Section 394 of the Penal Code, which prohibits the public exposure of any one affected with a contagious disease, except necessary removal to a suitable place, was enacted before the tubercular diseases were included in that list, and probably would not apply in its present terms. Section 3094 of the Political Code provides for reporting cases of cholera, smallpox, scarlatina, and diphtheria, and might be amended so as to include all forms of tuberculosis.

It is not to be presumed that public opinion at present would tolerate any limitation of the personal liberty of tuberculous subjects. The Political Code, for eighteen years, has required lepers to be segregated from the general population, but no one is required to report such cases; and, although the local authorities are commanded to notify the Secretary of State of all such as are kept segregated, no registration has ever been made, and the law nowhere states penalties for violating this act. It is very doubtful whether a law requiring cases of tuberculosis to be reported and registered would meet with even a fair degree of observance at the present time. Probably it would be wiser to wait until the public become better informed on the subject; otherwise we must expect violent opposition from some and passive resistance from the majority. Before the meeting of our Legislature in 1895, the working of the registration plan in Michigan, and perhaps in New York City, may become apparent, so that the State Board of Health may understand how to advise suitable legislation; if not, we can wait two years longer. Sanitary legislation should be somewhat in advance of the popular demand, but cannot succeed in opposition to general sentiment. At any rate, it is competent for this convention to declare its opinion in favor of specific enactments whenever there shall be reasonable prospect of willing observance.

In conclusion, we must not forget that certain domestic animals, especially milch cows, are notably subject to tuberculosis. Recent observations show that nations are affected by tuberculous diseases in proportion to their consumption of milk and its products. Thus the lower class of Egyptians and Chinese are contrasted with the Tartars, though the better condition of the latter apparently gives them the advantage. Somewhat less striking is the exemption of the Moors of northern Africa and the proneness of the Spaniards and Portuguese.

The prevalence of abdominal and intra-cranial tuberculosis among young children, diminishing as milk figures less in their diet, is also instructive. Cows are often seriously diseased before the appearance of cough, fever, and emaciation, but we have recently learned the trustworthiness of the tuberculin test, and it should be resorted to whenever there is cause for suspicion. The simple precaution of boiling milk would be a safeguard, if people could be induced to make it a strict rule; while it has been found that the bacillus tuberculosis is destroyed by exposure of milk to a temperature of 167° F. for ten minutes, or of 158° for fifteen minutes. Investigation by the New Jersey State Dairy Commission has shown, however, that all the constituents of milk are rendered less digestible by the temperature necessary for sterilization.⁵

It is believed by Bang, of Leipsic, that both the milk and the butter of the same, from cows with tuberculous udders, is infectious when used as food;⁶ but I am not aware of any tests yet made with cheese. Yet it would be unsafe to conclude that the milk is free of bacilli when the udders are apparently not affected, for Ernst obtained seven positive results from fourteen inoculations of such milk.⁶

The above considerations make it extremely desirable that the herds of cows which furnish milk to our cities should be kept under strict sanitary *surveillance*. In Copenhagen the Milk Supply Company, which sells the yield of more than 4,000 cows, is under the direction of experts, who have no share in the profits. The cows are examined every two weeks by veterinarians, and all the milk and cream are filtered.⁵ Until we can have the benefit of such supervision, our safety lies in the sterilization of fresh dairy milk by heat.

¹ *N. Y. Med. Rec.*, Dec. 23, 1893.

² *Med. News*, Feb. 10, 1894.

³ *Trans. Am. Pub. Health Asso.*, 1890.

⁴ *Pract. of Med.*, p. 569.

⁵ *Sajou's An.*, 1893.

⁶ *Sajou's An.*, 1892.

CREMATION AS THE ONLY SANITARY METHOD OF DISPOSING OF THE DEAD.

By W. F. McNUTT, M.D., M.R.C.S. (Edin.), L.R.C.P., Professor of the Principles and Practice of Medicine in the University of California.

It is not within the province of this article to give the history of the various methods of disposing of the dead. It becomes necessary, however, to say a few words on this aspect of the subject, in order to show that the treatment or disposal of the dead is not a matter of ethics, or a question of morals or religion. The methods of disposing of the dead in all countries is a matter of sentiment, superstition, usage, and necessity. But by all civilized peoples it should be dealt with as a purely sanitary measure. A reference to the history is the more necessary, as so many of the English-speaking people look upon inhumation, or burial of the dead, as a Christian rite—part of the Christian religion—and that all other methods of disposing of the dead are only to be practiced by pagan or heathen peoples. While, as a matter of fact, Christian nations do, at the present time, mostly bury their dead, the nation of all others that is most wedded and prejudiced in favor of inhumation, and that has practiced this method for hundreds of years before the Christian religion was ever dreamt of, is the Chinese. Neither history nor tradition reveals any information of the time when the Chinese disposed of their dead by any other method. At the present time their strong attachment for inhumation seems to depend upon the mere superstition that misfortune will follow the family whose dead are not at rest in the ground; and they carry their superstition to the point of insisting that no other ground than that of China can fulfill the requirement. To whatever land he may wander, in whatever land he may die, it is the sacred duty of the surviving friends to see that his bones (at least) find their final resting place in the land of his birth—in the Flowery Kingdom—and near some place that was dear to him in the days of his childhood.

In Japan, cremation is practiced by the Monto sect; but Shintos bury, while the aboriginal tribes in the remote north have been known to dry or desiccate the body, and subsequently bury it. The ancient Peruvians dried the bodies of the dead in the sun, and finally buried them in mounds. A tribe in South Australia places the dead body at the top of their huts, and keep up fires until the body is desiccated, when it is hidden in the trees. Some of our North American Indians dry their dead by exposure to the sun. The Syrians were known to place their dead at the disposal of wild dogs; while the Parsees for hundreds of years have had their "Towers of Silence," upon which they place their dead, and bury only their bones when the birds of prey have devoured the flesh. The Hindoos not infrequently place a dead body on the bank of the river, to be disposed of by river monsters. Many Kaffir tribes give their dead to the wild beasts; the Egyptians embalmed; the Hebrews mostly entombed; while the Hindoos, Greeks, and Romans cremated. Sea-burial is practiced to some extent, especially among island aborigi-

nees, while deep-sea burial has been recommended by several sanitarians to obviate the harmful effects of inhumation. One writer (Viritz) recommended that dead-ships be kept on the coast, and that daily departures be made for mid-ocean, where the bodies shall be committed to the deep. Water burial, however, is not likely to be practiced to any great extent, and many objections might be advanced against it. It has been thought by some that bodies might be petrified; it has been seriously considered in Germany whether bodies might not be encrusted in cement and placed in a cement sarcophagus, and cement in a fluid state poured about it—and all for no better purpose than to find some method of delaying the inevitable decomposition, of delaying the devolvement of the body into its ultimate constituents, which the laws of nature demand, the vegetable kingdom requires, and God himself has willed.

Seeing, then, that it is appointed that all must die, and that dust to dust sooner or later is the inevitable destiny of the body, whether buried in the ground, or deposited in the ocean, or hid away in the cave, or desiccated by heat, or placed upon the hilltop or in the tower of silence for the birds of the air, or exposed to the beasts of the fields, or piled in a Huacas, or burned by fire, or surrounded by the stony sarcophagus, or embalmed in all the balsams of the Orient with all the cunning and knowledge of the Egyptians, is it not, then, wise and reasonable to dispose of the body in the manner that its decomposition will be the least injurious to the living? The decomposition of animal matter on the surface of—or a few feet under the surface of—the earth, in the air, or water is accompanied by odors that are repulsive and horrible, and by gases and micro-organisms that are deadly destructive to human and all animal life. Could we read the cause of every death we would learn that millions of deaths have resulted from the putrefaction of the buried dead. With the recent developments of bacteriology we have learned that micro-organisms are the cause of the acute infectious diseases, and that these insatiable destroyers of human life do not die with their victims, but infest the earth above and about the grave; they find their way to the surface; they come forth more terrible than an army with banners; are scattered broadcast on the wings of the wind, and are carried to and fro by the birds of the air. Science has taught us this lesson, and yet, in obedience to superstition, to usage, and to sentiment, we continue to bury our dead; we fill and surround our cities with putrefying bodies, which contaminate the air we breathe, pollute the water we drink, and poison the food we eat.

If the members of the State Board of Health will permit me, I would like, in this connection, to suggest that they would have an investigation made to determine the relation of the water supply of the State to the burial grounds. Two or three years ago there was an endemic of malignant diphtheria on the Point Lobos road. I found that the families afflicted were using water from a surface well within a few hundred feet of the Odd Fellows' Cemetery. As you all very well know, burial is still permitted in San Francisco, and almost in the heart of the city. The distance from Laurel Hill Cemetery to the City Cemetery, where the indigent and Chinese dead are buried, is but a few blocks. You all perhaps do not know that between these two cemeteries there is a little lake, which is used as a water catch, and water to-day, strange as it may seem, is being served out of that horrible place to the citizens of San Francisco—simply seepage from the two graveyards. A few days ago I passed

through Cloverdale, and noticed that the graveyard was on a knoll on the bank of the Russian River, at the foot of which the citizens pumped their water supply from the river. How many graveyards there are on the banks of this river, and how many towns take their water supply from it, I do not know. The people of the towns and villages throughout the State generally select a hill or knoll near by for the cemetery, without the slightest regard to its relation to their water supply. Probably hundreds of lives are being sacrificed by this unsanitary procedure.

The neighborhood of burial grounds is proverbial for headaches, diarrhœa, and ulcerated sore throats. According to a report of the French Academy of Medicine, the putrid emanation from Père-la-Chaise, Montmartre, and Montparnasse have caused frightful diseases of the lungs, to which numbers of both sexes fall victims every year. It was proposed by Mr. Foreroy to analyze the foul gases evolved from bodies which had been interred in this over-saturated soil; but no grave-digger would venture to assist in its collection, because it resulted in almost sudden death if inhaled in the concentrated form near the body, and even at a distance, when diluted and diffused through the atmosphere, produced depression of the nervous system and an entire disorder of its functions. Professor Selmi, of Mantua, has lately discovered in the strata of air which has remained during a time of calm for a certain period over a cemetery, organisms which considerably vitiate the air, and which are dangerous to life. When the matter in question was injected under the skin of a pigeon, a typhus-like ailment was produced and death ensued on the third day. According to the Hon. Dr. Lyon Playfair's report to Parliament it is stated: "In most of our churchyards the dead are harming the living by destroying the soil, fouling the air, contaminating water springs, and spreading the seeds of disease. I have officially inspected many churchyards and made reports on their state, which, even to re-read, make me shudder. But the later discoveries of science point more strongly to other dangers, arising still more directly from the burial of the dead. Every year records new facts identifying the causes of certain of the most familiar types of contagious diseases with the presence of minute organisms (bacteria), the absorption of which into the blood, or even in some cases of the alimentary canal, suffices to reproduce the dangerous malady. One of the most deadly scourges to our race, viz.: tubercular disease, is now known to be thus propagated. The poisons of scarlet fever, typhoid, smallpox, diphtheria, malignant cholera are undoubtedly transmissible through earth from the buried body by more than one mode."

The Rev. S. Long, of Calcutta, says: "The Mohammedan cemeteries of Calcutta have long been a crying evil and the nurseries of cholera, fever, and dysentery." Dr. Edmund Parkes, Professor of Military Hygiene in the British Army Medical School, in his work on hygiene, condemns severely the practice of the burial of the dead. "Burying in the ground," he says, "is the most unsanitary of all the plans of disposing of the dead. The air over cemeteries is constantly contaminated and the water in the neighborhood highly impure, hence the dangers to the population in the vicinity of graveyards."

Sir Henry Thompson says: "I affirm that by burning we arrive in one hour without offense or danger at the very stage of harmless result which burying requires years to produce; but an infinity of mischief may happen by burial and none can happen by cremation." It is

estimated that 32,000 deaths occur annually for every million of people. London, with nearly 5,000,000, buries in and about it at least 150,000 annually, and if the body is in the process of decomposition for only about fifteen years, there are about 2,250,000 in the process of putrefaction in the soil of London and its neighborhood. For this purpose over two thousand acres of land are in use. The Bishop of Manchester, when consecrating a cemetery, said: "Here is another one hundred acres of land withdrawn forever from the food-producing area of this country. Cemeteries are not only becoming a difficulty, an expense, and an inconvenience, but an actual danger. I hold that the earth was made not for the dead, but for the living. No intelligent faith can suppose that any Christian doctrine is affected by the manner in which, or the time in which, this mortal body of ours crumbles into dust and sees corruption." Dr. Waller Lewis, in his report on excavations that had been conducted under churches in London, said that "the many phases of decay were varied, horrible, and a disgrace to any civilization." But it is needless to multiply evidence to show that with our present knowledge of the propagation of diseases, to allow a body to be buried in the ground in a city is a criminal assault against the lives of citizens, for which the authorities should be held responsible.

Dr. Koch, the renowned bacteriologist, says: "The blood of animals dying from splenic fever may be dried and stored for years and then pulverized into a powder, and still the disease germs survive with power to produce infection." The only manner of disposing of the dead without injury to the living is by our modern scientific method of incineration. With the history of cremation as practiced by the ancients, by the Orientals, and by other semi-civilized people at present, we do not propose to speak. Science has done much for the nineteenth century; but in no department of thought has it exhibited greater activity or made more progress than in the department which has for its object the discovery of the causes, prevention, and cure of disease. What might be called the renaissance of cremation (that is, the scientific methods at present adopted in Europe and America) was inaugurated in Italy; and most of the literature on the subject is in Italian, the Italians being the first European people to introduce it. It is only about twenty years since Italy commenced cremating, and less than that since the first crematory was built in Germany, France, England, or America; yet in these few years cremation has gained a firm footing in all these countries. The increase in the number of bodies that are being cremated each year is very considerable. Many new crematories are being built in Europe and America, and in conservative England cremation societies and cremations are rapidly increasing.

Most of the objections urged against cremation are the offsprings of sentiment, superstition, and usage. It is called a pagan practice, unchristian, revolting to our senses, etc. Says the Rev. Dr. Howard Henderson, of Cincinnati: "It would be a bold man who would affirm the prescription for a divine mandate for earth-burying or a divine prohibition of cremation. The method employed is a mere matter of custom, and to dogmatize it into a religious creed would be a profanation of ecclesiastical prerogative." The objection that has been recognized by the advocates of cremation as serious is the one that in the case of poisoning all traces of evidence would be destroyed by incineration, and the murderer might go free without even a trial. This objection has

been greatly overestimated; it is not as serious by any means as has been urged by the enemies of cremation and as has been granted by its friends. If a supposed murderer should occasionally get off scot free without a trial, it might not be so serious a matter to taxpayers, or so serious a matter for society, as to have hundreds of murderers who have been fairly convicted of murder by the evidence after a long and expensive trial set free by juries. Again, there is perhaps not one death in ten thousand where there can be any possibility be even a suspicion of poisoning; and again, every health office should have a medical officer at its disposal to verify the physician's certificate as to the cause of death in every case before a permit is given to dispose of the body. If an inquest be considered necessary, or if there be any suspicion of any such necessity, an examination should be made then. Mr. Danford Thomas made a very careful and systematic inquiry in England and Wales as to the number of exhumations for the past twenty years which involved questions of poisonings. He found that the exhumations did not average one yearly; yet the number of deaths in England and Wales is about eight hundred thousand.

Could anything be more absurd than to oppose cremation on the grounds that it deprives the officers of the law of the chances of exhuming a body in cases of suspected poisoning; that it lessens the chances of convicting the murderer? In burying the dead they are but depositing poisonous masses beneath the surface of the earth, which experiment, reason, and science teaches, poisons thousands of living beings. The one who administers poison to his fellow is committing a crime. The authorities who allow the burial of dead bodies in the midst of populated cities are permitting crime. And besides, disinterments are useless, except in the case of mineral poisons. The poisons that are most likely to be used, such as prussic acid, morphine, aconite, strychnine, etc., soon decompose after the burial of the body, and not a trace of them could be found if the exhumation is any considerable time after burial. And it has become almost a constant habit of injecting bodies with embalming fluid before burial, which renders the detection of poisons impossible. Under no circumstances should an undertaker be permitted to embalm or inject embalming fluid into the body, until he has received a permit from the health office for the disposal of the body. The chances of detecting poisons are so lessened by burial, that cremation, instead of protecting poisoners, would render their detection more certain by necessitating greater care on the part of the health department as to the cause of death; let them make an examination at once in every case where the cause of death is not absolutely certain. This disposes of the medico-legal question.

The history of cremation in America is interesting. Crematories, cremation societies, and the number of bodies cremated, are rapidly increasing in the United States. We have two crematories in California—one in Los Angeles, which has been erected since 1887; one in Cypress Lawn, San Mateo County. The latter, though only four months in operation, has cremated nearly a hundred bodies. It is but nine years since the first human body was cremated in the State of New York. At the present time, the United States Government has, on an island in New York harbor, a crematory for the incineration of the bodies of those who die of contagious diseases; while New York City, Buffalo, Troy, and many other cities have their crematories. Many of

the large cities in other States now have their crematories, and it is pleasing and safe to state that inhumation, or earth burial, is beginning to give place to the safer, less expensive, and altogether more desirable method, cremation.

Up to twenty years ago inhumation was the only method of disposing of the dead practiced by Christian nations. Inhumation will never again be the only method practiced by Christians in the disposal of their dead. In the meantime, dead bodies will be deposited in the ground, and in some cases within the city limits, where the putrefaction and micro-organisms will continue to poison the air, the water, and the ground. Thousands of lives will yet be sacrificed to superstition, sentiment, and usage, but at last the fittest, like truth, will triumph. Philadelphia no longer maintains that disgraceful and dangerous plot, viz.: a potter's field. There the indigent dead are cremated. Philadelphia sets a good example and one that should be followed by every city in the United States. Cremationists do not wish to force their method upon any one; they simply want that every one shall be free to choose without prejudice. They do believe, however, that municipal authorities should prohibit the burial of the dead within city limits; that it is criminal to ignore the established facts of science; that every city should cremate its indigent dead; and urge that in case of death from contagious diseases the body should be cremated. Municipal authorities arrogate the right of, and enforce quarantine, to the end that a person suffering from a contagious disease may not propagate it to others. Does the responsibility of the municipal officers cease when the victim of a contagious disease dies? Is it reasonable and just that a body should be disposed of in a manner that will propagate more disease and cause more deaths than could have been possible during the attack of the disease? Humanity, sentiment, and affection dictate that our dead be treated with reverence and respect; but the living demand and are entitled to protection. The sanitarian is contending for pure air, pure water, and pure earth. To those who call incineration revolting, could they once witness the exhumation of a body that has been buried a year or two, they would never be buried themselves, nor advise their friends to be buried. One experience would dispel all sentiment; the mind would ever afterward revolt against the usage. The eye cannot behold, nor the mind imagine, a more repulsive, shocking, or hideous sight. The grave is a horrid, grim, loathesome, charnel house, where worms desecrate the body and feast upon corruption. How abhorrent to the imagination! It would require a Milton or a Dante to depict it. In modern cremation there is nothing repulsive. The body wrapped in white linen is placed in the superheated fire-clay chamber, where no flame comes in contact with it. All that is liquid or putrefiable disappears in a few minutes, and there is left the ashes—which are inodorous, inoffensive, and without the germs of disease—to be placed in the sacred urn and deposited in the columbarium of the church. It is simply a last baptism by incandescent heat; a purification by fire, whereby the corrupt takes on incorruption. As the mortal takes on immortality, so the corrupt takes on incorruption; as the one robs death of its victory, the other robs the grave of its horrors and dangers. Immortality of the soul, incorruptibility of the body—man's final triumph over death and the grave.

PREVENTION OF CONTAGIOUS AND INFECTIOUS DISEASES, WITH SPECIAL REFERENCE TO TUBERCULOSIS.

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Mr. President and members of the Sanitary Convention of the State of California:

As near as philologists and anthropologists can determine, our forefathers came from one of the alluvial valleys in Asia, along the sacred river Oxus, about—I was going to say ten million years ago, but as our western sacred book puts it six thousand years ago, that date will suit our purpose just as well. Prophylaxis at that early date was not up to our nineteenth century standard, although we learn many truths from the writings of the wise men who flourished long before our Christian era. But somehow or other, primitive religions, or metaphysical doctrines, about cosmogenesis and anthropogenesis have been mixed up with the truths of physiology and medicine. One of the ancient books of India—the country which gave us birth and life; the country whose religious superstitions antedate our modern mythology some millions of years; the country which to-day laughs at our so-called western civilization—well, one of this country's ancient volumes confidently asserts that the feet and the sense of sight owe their origin to fire, because walking generates heat, and sight is only possible with the aid of light; the skin owes its origin to air, because the skin is the organ of touch; the ear and the faculty of speech owe their origin to ether, because the power of speech is one of the principal means for the generation of sound, whilst the ear is the only medium by which sound is appreciated and conveyed.

SUPERSTITIONS IN MEDICINE.

From ancient India medicine found its way into Egypt and Asia. The many different gods, in the imaginations of men, have always been, as they are to-day, appealed to in order to cure and prevent disease. The stars came in for their share, not only for the ailments of men, but also for the birth, growth, and destinies of empires. Even animals and idols have their worshippers. In India it is the sacred bull, cow, and monkey; in Egypt, the ibis and the cat; in Turkey, the dog; in Greece and Rome, the sacred snake, seen even to this day, twined about Hygeia's staff as the emblem of the goddess of health.

The talisman and sacred charms are used by millions of people of all nations to prevent disease. In India it is a mark on the forehead, or a sacred string about the neck. In Egypt the sacred beetle holds full sway. In western civilization it is a sacred garment, the remains of some saint, a picture, a flower, or a coin. The Mohammedans are at once healed of all their ills if they can but look upon a hair from their Prophet's beard. The Christians are miraculously cured by a drachm

vial of the water from Jordan, or a relic, real or imaginary, of some departed mortal.

Nor is this all. A large part of our community resort to recalling the spirit of some half-forgotten friend long since dead. Indeed, they even clothe these spirits with flesh, in their own imagination, that a touch may cure disease. Our aborigines practice the casting out of devils, as was done in Egypt and Asia, for the cure or prevention of disease.

Homer describes surgery fairly well, but does not do much for medicine; whilst Hippocrates describes the body as made up of four humors, viz: blood, phlegm, yellow bile, and black bile; a right proportion of which constituting health, improper proportions resulting in disease. Hippocrates also believed in the efficacy of odd and even days for the cure of diseases. Even Galen followed Hippocrates and added a *fifth* structure to the humoral theory. This he called spirit; it passed through all the humors.

From the ancients down to Hippocrates and Galen, and from the fathers of medicine to Paracelsus and Sydenham, our ancient and honorable calling has been filled with superstitions about benign and malignant influences as inexplicable as they are absurd. Nor are all of these theories abandoned at the present time. Consequently, epidemics of contagious and infectious diseases have had, and are still having, full sway.

Even the Mormons of the present day practice incantations and superstitious absurdities for the cure of mortal diseases. A moribund patient is made to swallow some holy olive oil from the Mount of Zion, his body is anointed with some of the same, and the Elders then lay on their holy hands to effect a cure. The latest charm for the cure and *prevention* of disease is the so-called Franco-German ring, made of nickel alloy, which costs about 5 cents and sells for \$2. This you have doubtless seen upon the fingers of hundreds of people. It is said to be an infallible cure for almost anything, but especially so for rheumatism. What can we expect from people with such superstitious and absurd ideas but the rapid spread of disease. Why, there are people living to-day who will tell us that they cure smallpox, or any of the contagious diseases, by means of so-called Christian Science. I recently witnessed one of these so-called cures. A "healer" was praying every half hour, at \$2 50 a prayer, and rubbing with his holy (?) hands the person of a young lady who had double pneumonia. She was in a dying condition when I entered the room, and yet no licensed physician had seen her before.

INFECTION AND CONTAGION.

But enough of this wholesale and criminal superstition regarding preventive medicine. Enough of sacred relics and blessed charms. Away with them and the spirit-healing charlatans. Let us educate the people up to the scientific fact that all infectious and contagious diseases have a specific *materies morbi* which is communicable and *preventable*. It is now generally understood that smallpox is contagious; that vaccination is a prophylactic measure, which should be enforced by State and municipal authorities, and that isolation and disinfection prevent spreading of the disease. Diphtheria, scarlet fever, measles, whooping-cough, cholera, typhoid fever, typhus fever, erysipelas, tetanus, puerperal

fever, septiciæmia, and tuberculosis are equally competent to spread and infect the community, and require as careful isolation and disinfection. Without going into the *modus operandi* of infection operative in each disease, as that would carry us beyond the present scope of this paper, suffice it to state

HOW DISEASES ARE CONTRACTED.

According to the eminent biologist, Prof. Wm. H. Welsh, of Johns Hopkins University, the specific micro-organisms of pulmonary tuberculosis, pneumonia, influenza, rabies, and diphtheria are found in the sputum and may be disseminated by it. It is also probable that mumps, scarlet fever, measles, whooping-cough, typhus fever, and smallpox may be taken into the system by inhaling the germs floating in the air surrounding these patients. It is almost certain that typhoid fever, cholera, actinomycosis, dysentery, intestinal anthrax, trichinosis, yellow fever, and tuberculosis are contracted by eating and drinking the germs in contaminated food and water. Whilst puerperal fever, tetanus, septiciæmia, oriental pest, rabies, leprosy, anthrax, glanders, erysipelas, osteomyelitis, pyæmia, tuberculosis, cutaneous parasitic diseases, lupus, smallpox, the acute exanthemata, gonorrhœa, and syphilis are contracted by inoculation and absorption.

The breath itself is seldom contagious so long as it is moist, but when it becomes dry, or the bacilli from dried sputum mingle with it, then the breath may become a danger to those who inhale it. Many of these diseases are contracted through insects, such as flies and mosquitoes. This is true of tuberculosis, typhoid fever, anthrax, and cholera.

Sawtschenko found living cholera bacilli in the excrement of flies, which, as we know, may be deposited in food or in drink and on wounds.

Many diseases are contagious by actual contact or inoculation. Tuberculosis is usually contracted by inhalation, or by swallowing the germs in milk or meat, but the disease may also be conveyed by inoculation (as seen in the case of washerwomen), just as syphilis has been conveyed by inoculation on the hands of surgeons.

In human beings foetal infection through the placenta has been observed in smallpox, measles, relapsing fever, syphilis, croupous pneumonia, typhoid fever, anthrax, and Asiatic cholera.

Tuberculosis is probably seldom, if ever, inherited, although Baumgarten vigorously maintains the doctrine.

ISOLATION AND DISINFECTION.

Now that we know how the various diseases are communicated from man to man or from beast to man, and *vice versa*, it behooves us as sanitarians to establish preventive measures, and this can be done by strict quarantine, isolation, and disinfection.

My plan is to isolate the patients in suitable quarters, have special nurses for all these cases, and disinfect everything from the patient down to the air that is breathed.

In acute exanthemata I have found that one half to one per cent of carbolic acid in olive oil or cocoanut oil answers admirably for anointing the patient's body. It allays the itching and prevents the *materies morbi* from floating about and infecting the air. For the living-rooms

I use 1 in 500 of thymol, or 1 in 10 of creasote by means of steam atomization. I saturate the air with these remedies. All the clothing, bedding, etc., should be thoroughly boiled or burned. The dishes used for food should be as isolated as is the patient. Kind friends should be requested to remain at home, and the utmost care taken to prevent spreading the disease. The carpets should be taken up, and all articles of furniture, not absolutely necessary, should be removed. It is always advisable to saturate blankets with 10 per cent of carbolic solution or 1 in 100 of bichloride of mercury, and hang them on the outside of each door. The secretions and dejecta should always be received in solutions of 8 ounces to the gallon of carbolic acid, or 4 ounces to the gallon of chloride of lime. Never allow discharges to be emptied into the sewers until thoroughly disinfected.

In diphtheria, antiseptic gargles and sprays are of great value in destroying the contagium, just as are antiseptic douches and lotions in purpurial fever and sloughing ulcerations. It is of the utmost importance for us as physicians and sanitarians to see that all apartments occupied by patients having any of the communicable diseases mentioned shall be thoroughly disinfected before occupancy by any other individual. The floor and walls must be scrubbed with an acid solution of bichloride, as the ordinary bichloride forms albuminates and becomes inoperative as an antiseptic. Two drachms of the bichloride and two ounces of tartaric acid to each gallon of water forms a good antiseptic wash. The paper on the walls must be removed or painted, and all the linen, bedding, etc., thoroughly boiled or burned. Then subject the room to fumigation by chlorine or sulphurous acid for four hours, after which allow plenty of pure fresh air and sunshine.

CONSUMPTION AND ITS PREVENTION.

Early History.—In 1810, Bayle demonstrated that persons having died of consumption exhibited peculiar grayish nodules in various organs of their body. Laënnec considered these nodules specific of tuberculosis. Virchow named these tubercular deposits cheesy infiltration or caseation. Scrofulous enlargements, such as glands, were later on considered tubercular. In 1865, Villemin discovered that these cheesy tubercular deposits would, by inoculation, produce tuberculosis in healthy animals. Klebs and Cohnheim later on declared that tuberculosis was a specific, infectious disease, contrary to the generally accepted theory of Niemeyer, that consumption in the main was a chronic, non-specific inflammation of the lungs. Later on, Koch, in 1881, isolated the micro-organism which is now proven and accepted by the scientific world as the specific pathogenic germ of tuberculosis.

All wasting diseases of the lungs are not necessarily tubercular. We have chronic bronchitis, bronchorrhœa, chronic cirrhosis of the lungs, abscesses of the lungs, etc., with more or less expectoration, fever, sweating, and emaciation, which are not due to the bacilli tuberculosis; but the vast majority of cases of consumption must be looked upon as tubercular, and if you will look for the bacillus you will nearly always find it.

The Bacilli.—The tubercle bacilli, as you all know, are small rod-like bodies, having a length of about one fourth to one half the diameter of the red-blood corpuscle, so that it requires from 7,000 to 15,000 of these rod-like vegetable bodies, if placed end to end, and from 50,000 to 75,000

of them, if placed side by side, to measure one inch. The interior of these rods contains very minute colorless spots—spots which do not take up the usual stain used for the bacilli. These are the spores—the most dangerous part, as they are exceedingly difficult to destroy. It is more than probable that the bacilli we discover under the microscope in the sputum of a phthisical patient are merely the dead shells or carcasses holding the living spores.

Staining of Bacilli.—The staining of tubercle bacilli is exceedingly simple, and should not be neglected by any physician when in doubt as to the case being tubercular. Spread the sputum on a microscopic cover glass. Pass it through an alcohol flame three or four times, to dry and fix it. Then let the cover glass float, sputum downwards, for a short time in the staining fluid. After taking the preparation out of the fluid, immerse it in a 33 per cent solution of nitric acid in water. This removes all the coloring matter, excepting that which is taken up by the bacillus, which may then be readily seen under the microscope. The staining fluid most in use is composed of 16 per cent aniline oil in distilled water; filter, and add 10 minims of concentrated alcoholic solution of methyl-violet or gentian-violet to one half a watch-glass full of the aniline water, and the staining fluid is complete.

The tubercle bacilli will be found in tubercular sputum, lungs, brain, intestines, spleen, liver, kidneys, glands, scrofulous or tubercular bones, and in the so-called lupus, which is in fact nothing but a tuberculous skin. The bacilli are frequently found in chickens, dogs, monkeys, guinea-pigs, and cattle. The “pearly distemper” of cows is now definitely known to be tuberculosis.

HOW DOES TUBERCULOSIS INFECT MAN?

It is now agreed that tuberculosis cannot, like syphilis, be born in the infant. It must be acquired. Therefore, if acquired it can be and should be prevented.

Dr. Billings says that in consumption the specific germ is very rarely, if ever, transmitted, inheritance giving only a special susceptibility to its action. The effect of occupation and bodily condition also plays an important part. This is proven by Dr. Biggs, who shows that out of every thousand deaths amongst farmers, only 103 die of tuberculosis, whilst out of every thousand deaths amongst printers 460 die of the disease. Fourteen per cent of all deaths is from tuberculosis.

Tubercular diseases play sad havoc in every civilized country in the world. Statistics show that about *one seventh* of all deaths from all causes is due to this same tubercle bacillus. This fact should be firmly impressed upon the mind of every physician and every sanitarian; also that an acquired disease must be a preventable one. One quarter of all deaths occurring between the age of fifteen and thirty years, according to Dr. Biggs, is due to tuberculosis. This would seem to increase the percentage even more, for many children die in infancy and many people die in old age of causes not tubercular.

During the twenty-five years ending 1886, the average annual deaths in England from consumption reached the enormous number of 50,000. During any one year in the United States over 150,000 people die of tuberculosis! And yet we are bound to admit that the disease is a preventable one. Over 30,000 deaths from tuberculosis occurred in New

York City during the five years ending January 1, 1893, whilst all the other contagious and infectious diseases combined, including smallpox, typhus, typhoid, scarlatina, diphtheria, measles, and whooping-cough, only caused the death of 21,000 during the same period.

WHAT ISOLATION OF TUBERCULOUS PATIENTS HAS DONE.

A hundred years ago a law was enacted in Naples which compelled physicians to report all cases of consumption to the Health Department, under penalty of a fine of three hundred ducats. A second offense was punished by ten years' imprisonment. Thus Naples reduced its mortality of consumption 90 per cent. Improved hygienic conditions and isolation of tuberculous patients in England has reduced the mortality 50 per cent within the last few years. Philadelphia during the last eight years has reduced her mortality from phthisis 20 per cent.

There is every reason to believe that man becomes infected principally from the sputum of phthysical patients. This dries upon the ground, on the floor, linen, and other objects. It becomes powdered, and with the dust particles the bacilli float about in the air. Thus we see how easy it is for infection to take place.

Sternberg says there can be no doubt that a large proportion of cases of tuberculosis in man results from the respiration, by susceptible individuals, of air containing the bacilli in suspension in a desiccated condition. He also claims that the germs of tuberculosis may remain in the air for many months and retain their vitality until they find a favorable soil for multiplication.

WHY WE HAVE PULMONARY TUBERCULOSIS.

The vast majority of cases of phthisis occur in the lungs. Why? Because the germs are breathed in. Inoculation experiments prove that the first expression of the disease takes place at the site of its inoculation. Extension may then be rapid or slow, and become general or remain localized. If inoculation be practiced in the anterior chamber of the eye, the first tubercular nodule will appear on the iris. If it be in the abdominal cavity, we have first a tuberculosis of the abdominal glands and peritoneum. If the bacilli enter a wound or a scratch on the hand, the first manifestation of tuberculosis will be seen in the nearest lymphatic gland. Consequently, if the germs are breathed into the lungs we have first a tuberculosis of the bronchial glands and lungs.

For several years Tappeneiner and others powdered tubercular sputum in the Pathological Institute in Munich and had different animals breathe it. In every case the animal experimented upon became tuberculous. Domestic animals also play an important part in the production of tuberculosis in man. Chickens will eat the sputum of phthysical patients and contract the disease. By eating chickens undercooked, they may communicate tuberculosis to man, although the disease is claimed to be slightly different. Dogs, in like manner, become consumptive, and may readily communicate the disease by licking the mouth. Fissures and excoriations of the skin may also become infected. Meat and milk often spread tuberculosis. Cattle frequently become consumptive. The "pearly distemper," as we have seen, is tuberculosis, and it is estimated

that at least 3 per cent of all cows have the disease. The meat, as has been proven by Strümpell, is competent to communicate tuberculosis by infecting the intestinal glands with the uncooked bacilli. Billings assures us that one half of one per cent of all meat sold for food is tuberculous. More frequently, however, the communication is produced by diseased milk. Palleske, in "Virchow's Archiv," concludes from a series of experiments that even micro-organisms are found in 50 per cent of human milk. Cow's milk frequently contains bacilli tuberculosis, and nearly always when the udder presents pearly nodules. Sternberg emphatically assures us that tubercular bacilli are frequently, if not *usually*, present in the milk from tuberculous cows. This has also been proven by Ballinger, Hirschberger, Ernst, and others. Sternberg says the conclusion is reached that the milk may contain tuberculous bacilli even when the *udder of the cow is not involved*.

This will no doubt explain why so many children die of tubercular meningitis and consumption of the bowels, and yet we have no systematic scientific examination of milk in any part of California. We have no scientific inspection of any article of food that we consume. Is it any wonder one seventh of our deaths is from tuberculosis? One sometimes wonders how it is so many escape. When any one with a scrofulous diathesis or a weakly strumous tendency inherited from phthisical, sickly, or drunken parents, or those who through former illness or occupation have so far reduced their vital resistance as to be in poor health, it can readily be seen how such individuals may easily become tuberculous. They are certain to breathe in the germs; if not at home from some member of the family, then the air in street cars, railway carriages, churches, theaters, the streets and public highways is sure to contain the bacilli so long as that filthy habit of spitting is permitted. Our modern sweeping-machines are excellent microbe disseminators. Those in San Francisco can be particularly recommended for that purpose.

BACILLI IN AIR AND EARTH.

According to Billings, bacteria are persistently present in the lower stratum of the atmosphere we breathe, just as they are nearly always found in the upper stratum of the earth, especially in graveyards. These statements hold good with the exception of high altitudes, mid-ocean, and polar regions. Tuberculosis is rare over 10,000 feet, and never found over 16,000 feet elevation.

The bacilli most frequently found in the air and in the earth are those of tuberculosis, malignant œdema, tetanus, summer diarrhœa, anthrax, malaria, diphtheria, and cholera.

Dr. Osler has estimated that from one and one half to four billions of bacilli are expectorated daily by every well-marked case of phthisis.

Cornet examined the dust on the floor, on the walls, in the curtains, etc., in houses previously occupied by phthisical patients, and found it teeming with bacilli. When these were injected into guinea-pigs consumption was rapidly established. This is about what we would expect. How could it be otherwise? And yet we move into these houses and occupy the very rooms without knowing or caring who occupied them previously.

In prisons the mortality from consumption often reaches as high as 50 per cent of the total deaths. This is easily explained when we remember that the rooms are infected with the deadly germs.

MARRIAGE OF CONSUMPTIVES SHOULD BE PROHIBITED.

Intermarriage of consumptives is one of the most baneful practices modern civilization countenances. Hundreds of deaths occur annually from this cause alone. Not only are the offsprings weakly and puny, prone to contract tuberculosis from one or both parents soon after birth, but the husband or wife, even if perfectly healthy, will contract the disease from the sick one. I recently saw this exemplified in my own practice: A perfectly healthy young woman of twenty married a consumptive, who died two years later. The good wife was a more or less constant attendant on her sick husband for these two years. At the end of about one year the woman's health failed. I ordered her into the country for rest and change. She went, although loath to go, but only remained away a few weeks; after which I could not persuade her to leave her sick husband. After his death I examined her carefully. The left apex gave evidence of impaired nutrition, prolonged expiration, and harsh breathing. The sputum, which was very scanty, contained bacilli now and again. In fact, she had contracted tuberculosis. She was treated for some months; gained twenty-five pounds in weight. Sent to the southern part of California, returning in about one year. She came back to the city and remained fairly well for about five years. The first thing I knew she was married a second time. Her second husband was a strong, robust man of about twenty-seven, with no phthisical history in his family. About a year or less after her second marriage, the woman's health began to fail. She again consulted me and I found that consumption was reëstablishing itself. The sputum contained millions of bacilli. The apices of both lungs were involved, and she died in less than a year. Now, it is the second husband's turn. Instead of a robust man he has fallen off in weight. His cheeks are no longer rosy and plump, but sallow and thin. He is developing some cough, and although I have not as yet had the opportunity of examining his sputum, I fear he has become inoculated.

Dr. Webber reports a consumptive husband who lost four previously healthy wives from tuberculosis. Another man lost three wives in a similar manner; and four other tuberculous husbands lost two wives each—all contracted from the sick men whom these faithful women nursed.

THE CARE WE TAKE IN BREEDING HORSES AND DOGS.

We go to any expense and care to breed healthy full-blooded horses. Stables of palatial pretensions are erected for them in the most salubrious climates. A veterinary surgeon visits them frequently, inspects their food, and directs their exercise and the hygienic conditions under which they live. Dogs are similarly cared for and tended; and yet, sad to relate, no such care, attention, or prophylaxis is attempted in regard to the human race. It is, indeed, a sad commentary on the value we place on one of God's noblest creation, when we have to chronicle the fact that more care and more thousands of dollars are expended on a horse or a dog than on the life of a human being. The horse and the dog are carefully mated and cared for during gestation, whilst man in any condition is permitted to marry whom he pleases, although loved ones are carried to the grave by the hundreds. And the soil for scrofula and tuberculosis is prepared for generations yet unborn by such unwise, unjust, and unjustifiable marriages.

The wearing of clothing, earrings, etc., previously worn by consumptives, may spread the disease. Laundry women have been known to contract the disease from washing infected clothing. Consumptives occupying public positions, such as clerks in post offices, banks, etc., are dangerous to public health. Clerks in grocery stores and dry goods establishments should not be consumptive, as the dry sputum might easily infect the food and wearing apparel they handle.

IMPURE FOOD.

Fully as dangerous as the foregoing is the matter of impure food. Last year I had the honor of pointing out, in a paper read before the Sanitary Convention of the State of California, that much of our food was unfit for use, as it had not been properly examined. A still greater evil exists in the milk supply of San Francisco and many other cities. I have examined many samples of milk and I am bound to confess that very few of them came anywhere near the standard prescribed in England, Germany, or the standard for pure milk in our own country. But the most dangerous consideration is that of tuberculous milk. Of this I found more than one sample. Several other investigators have corroborated my researches. It is now conceded, and capable of demonstration, that from three to five cows in every hundred are suffering with "pearly distemper," or tuberculosis. Their milk contains the bacilli of the most dreadful foe the human race has to contend against, and yet we have no scientific milk inspection. Butter may also contain the germs, as we know meat does. Who can tell how many cases of *tabes abdominalis* are due to the bacilli-laden milk the infant drinks? Consumption of the bowels is not an infrequent disease in San Francisco, and it has been fully demonstrated that tuberculous milk does produce the fatal disease; not only is this the case with infants, but also with grown people.

Dr. Ollivier reports an instance requiring more than a passing notice. It was in a boarding-school for young ladies. In the course of some little time several of the scholars were taken ill with tuberculosis and removed to their homes. Sanitarians inspected the premises. The plumbing was good, the air was salubrious, and the buildings were properly ventilated. The food and water were found to be wholesome, and no cause could be assigned for the disease. Still one after another came down with abdominal or pulmonary tuberculosis, until the number had reached twelve. Everything had been examined excepting the milk. This was the last article of food thought of, as it was procured from a large dairy not far away. However, upon investigation the milk was found to contain tuberculous germs, and as milk was cheap and presumably healthy the young ladies of the school had been fed upon it *ad libitum*. The cows were next inspected and many of them were found to have "pearly distemper," or consumption. The owner of the herd was forced to withdraw his milk from the market, and not knowing what to do with it, he fed it to his pigs. The records show that even the pigs could not stand the bacilli of tuberculosis, as all died from the disease within a year. Suffice it to say that as soon as healthy or boiled milk was supplied to the young ladies at school there was no more consumption. If any further proof is necessary to convince you that milk may contain the microbes of consumption, I can only add that if you will analyze carefully the milk supply of any large city you are almost

certain to find the bacilli, and if you will inject such milk under the skin of a guinea-pig I can assure you the poor animal will die of tuberculosis in a few weeks.

It is claimed, and rightly so, that if bacilli are introduced into the stomach of a healthy individual, they are usually digested or rendered inert. But how many infants and grown people who drink milk are not healthy? How many have the necessary resisting power? We all know that there are thousands upon thousands of susceptible cases in every large city, and these are the first victims. It is all wrong; it is non-scientific; nay more, it is absolutely criminal to allow such matters to go unchecked. We owe it to ourselves, and to our families, and to the community at large, to enter our solemn protest against the consumption of articles of food, and especially of milk, until they have been carefully and scientifically examined by competent authorities. Every Board of Health should have the power to appoint competent chemists and bacteriologists to investigate this matter, and thus lessen the mortality from tuberculosis.

ISOLATION OF CONSUMPTIVES.

The disposal of consumptives, both living and dead, is another subject of considerable importance. There cannot be the slightest doubt that consumption is communicable from one person to another in the various ways indicated. It therefore cannot be denied that every consumptive becomes a danger to those around him—a danger to public health. What shall be done with him? Shall we, as intelligent physicians, fully aware of the danger, prostrate ourselves before Allah, as do the good Mohammedans in times of cholera epidemics, and say, "Let thy will be done, there is no God but Allah"; or shall we stand calmly by with our hands folded and our faces to the sun, as do the people in India, imploring protection from Brahma and Vishnu, the creator and preserver, that Shiva—the destroyer—does not annihilate us? Or shall we as men imbued with western thought and civilization, and freed from the trammels of oriental and occidental superstitions, assert our rights as teachers of the healing art, and determine what had best be done with the unfortunates who become consumptives? I say, yes. We must protect the public health. In that event we are bound to isolate and care for consumptives, so that the disease does not spread. Naples reduced her mortality from consumption 90 per cent by these means; England, 50 per cent, and Philadelphia, 8 per cent.

California is rapidly becoming the great sanitarium for these unfortunates. If we allow them to come to our shores to seek health, is it not proper that we should protect the healthy? Should we not protect our fair shores, with its sunny and balmy atmosphere, from becoming a cess-pool of contagion and infection? How can this be accomplished? Not by denying consumptives to come to our fair land to be cured, no; but by proper isolation, by properly regulated sanatoria, giving them all the advantages of climate, hygienic surroundings, rationally constructed buildings, and scientific medication.

CREMATION OF CONSUMPTIVES.

What shall be done with those who die of tuberculosis? It is estimated that 32,000 die annually to every million that are living. This means that forty-eight trillion of people die annually, of which one seventh, or three trillions five hundred billions, die of tuberculosis. These figures are almost incomprehensible. At fifty pounds to each consumptive's body there are over one trillion seven hundred and fifty billions of tons of consumptive bodies for burial annually. Fortunately they are not all buried. Many of them are, as they should all be, *cremated*. The bacilli of tuberculosis have been found in old cemeteries in which no inhumation had been practiced for over twenty-five years. Tuberculous bacilli can invariably be found, even on the surface of the soil, in all cemeteries. The earth-worms bring them to the surface, as proven by the experiments of Pasteur and others. It takes from five to twenty years for human bodies to decay. And as millions upon millions of consumptive bodies are continually being added to those already buried, the result must be self-evident, and instead of one seventh of our population dying, as they do now, of tuberculosis, it must of necessity soon become one half. Something must be done, and that before it is too late.

The Mosaic laws direct that all lepers be driven out of their houses and their effects burned. What leprosy was to Moses and his people, and is to-day to the Hawaiians, tuberculosis is to the American people—the greatest scourge the human race has ever encountered.

RULES FOR THE PREVENTION OF TUBERCULOSIS.

Comprehensive and efficient means should be at once adopted for the prevention of tuberculosis. I will recommend the following:

1. Educate the public to a proper understanding of the communicable character of tuberculosis. Teach them how they can avoid contracting the disease themselves, and how they can prevent transmitting it to others.

2. The promiscuous expectoration of consumptives should be prohibited. The sputum should be received into a 10 per cent solution of carbolic acid, or an acid solution of bichloride of mercury, 1 to 100. Should this be impracticable at times, let the sputum be collected on paper napkins or handkerchiefs, which must be burned before they become dry. Under no circumstances should a phthisical patient be allowed to spit on the floor in public places, or on the streets.

3. Let every physician employ systematic bacteriological examination for the early diagnosis of the disease, and let us inaugurate compulsory registration of all cases of tuberculosis.

4. It should be made compulsory to have careful and thorough disinfection of all houses, apartments, penal and reformatory institutions, carriages, street and railway cars, theaters, churches, etc., which have been exposed to infection from phthisical patients. The breath of consumptives is not infectious, nor is the sputum, except by inoculation, until it is dried and the bacilli are allowed to float in the atmosphere. For disinfection of rooms I would recommend sulphurous acid gas obtained by burning 1 ounce of sulphur to every 10 cubic feet of space, or chlorine gas. Shut all doors, windows, and crevices for four hours.

Then let in the fresh air and scrub the walls, floor, and articles of furniture with the acid bichloride solution: 3ij of bichloride of mercury and 3ij tartaric acid to the gallon, or 3ij of each of the bichloride and permanganate of potassium to the gallon of water. Remove all wall paper if it cannot be washed or painted. Thoroughly boil or steam all bedding, carpets, curtains, etc., for at least one hour.

5. Under no circumstances should the stools of tuberculous patients be emptied into the sewers until they have been disinfected. The intestinal glands are frequently implicated in tuberculosis, and the dejecta often teem with bacilli; therefore, all discharges should be received into a solution of 8 ounces of carbolic acid to the gallon, or 4 ounces of chloride of lime to the gallon of water.

6. Enact regulations prohibiting tuberculous individuals from following vocations that may expose others to the danger of infection. The sputum may dry on their beard, or on their clothing, and thus be disseminated. For the same reason consumptives should avoid kissing, and even hand shaking, to protect those near and dear to them. All dishes and drinking cups should be used by the patient exclusively. They should never be mingled with those in use by other members of the family. The promiscuous use of public drinking cups in schools, cars, streets, and churches cannot be too severely condemned, as contagion is possible from this practice.

7. Tuberculous mothers should not nurse their children. In fact, consumptive people should not be permitted to marry.

8. There should be established careful scientific examinations, under city and State control, of all milk, meat, and other articles of food sold. All animals suffering from tuberculosis, anthrax, septicæmia, glanders, cattle plague, swine plague, sheep-pox, foot and mouth disease, acute pneumonia, actinomycosis, dropsy, and rabies should be killed and at once cremated.

9. Consumptives should always be isolated, and there should be established, under State control, public hospitals and sanatoria for the segregation and isolation of the consumptive poor, where they could live under the best hygienic laws, and receive proper food and judicious medicament.

10. All persons having died of tuberculosis should be at once wrapped in sheets wrung out of bichloride solution, and cremated as soon as practicable. If this be not possible, then they should be buried with quicklime, as the bacilli do not die with their hosts, but have been found in cemeteries from two to twenty-five years after inhumation.

With these simple though efficient precautions I can promise you a reduction of at least 50 per cent in the mortality from tuberculosis during the next ten years.

A PLEA FOR THE PREVENTION OF TUBERCULOSIS.

By GEO. M. KOBER, M.D., of Fort Bidwell, California.

Consumption stands first upon the list of the principal causes of death; it caused 12,059 deaths in every 100,000 from all causes during the census year (Billings¹).

The report of our State Board of Health for the year ending June 30, 1892, shows that this disease caused 2,304 deaths, or nearly one seventh of all the deaths in an estimated population of 1,250,000.

Statistics of consumption include almost as a rule only those who die with lung manifestations, and little is said of the children and others who perish from tubercular meningitis, peritonitis, and other tubercular affections.

Tuberculosis not only leads the list of diseases in order of frequency and mortality, but the loss entailed by the long duration of the disease, and the danger to others from infection, renders the subject of grave importance from an economic as well as a medical point of view.

Whilst it is certainly true that the climate in various sections of this State exerts not only antagonistic, but also curative effects in this disease, we must remember that we have as yet a very sparsely settled State, and that certain regions in Europe, formerly exempt from the disease, have now become infected since intercourse with phthisical communities and subjects has been established.

We have invited for years the victims of consumption to breathe our pure air. In doing so we have exposed others to the ravages of a communicable disease, and it becomes our imperative duty to lessen the danger from infection, and failure to employ every known means of prevention can only be classed as criminal negligence, and I hail, therefore, with great satisfaction the resolution which declares "consumption and its allied diseases as dangerous to the public health." Whilst perhaps few medical men will be found to-day who do not believe that the disease arises either directly or indirectly from a preceding case, yet if we desire to influence legislation in matters of public health, our case should be stated on good evidence and in unmistakable terms.

In view of the importance of the subject, I have collected the following data from reliable sources regarding the contagiousness of consumption:

The classical researches of Koch² have established, beyond a doubt, the infectious character of tuberculosis in animals and man, whether observed in local tubercular deposits or in acute miliary tuberculosis, and that the disease is everywhere caused by a specific microbe, the bacillus tuberculosis.

This bacillus has been found in the system and in all tubercular deposits, and under a high power microscope may be seen to consist of small, usually curved rods, which readily undergo spore-formation. A pure cultivation of these bacilli, when introduced into the body of a healthy animal, produces the disease in question.

The tubercle bacilli have not yet been observed in the soil, water, or atmosphere. Cornet,³ however, demonstrated their presence in the dust and on the walls of rooms inhabited by consumptives, and he, as well as Cadeac and Malet,⁴ successfully inoculated the germs thus found into healthy animals.

Martin, quoted by Dr. Potter (N. Y. Medical Record, February 24, 1894), in examining the dust of one of the most frequented streets of Leipzig, found the tubercle bacillus in about 80 per cent of the specimens.

The bacilli have also been found in the *milk* of tuberculous mothers and cows, especially when the lacteal glands were the seat of the disease, or the system infected with general tuberculosis. This last remark also applies to the presence of the bacilli in the *flesh* of animals used for food; they have also been found in the *blood* of those affected with acute military tuberculosis, but only in limited numbers.

Villemin states that the contagious principle has also been found in the *feces*.

According to Uffelmann,⁵ the tubercle bacillus is an obligate parasite which does not develop in the ordinary culture media, but is best propagated in blood serum, glycerine agar-agar, at a temperature of 99° to 100°. If the temperature is below 50° or above 108°, they cease to grow. The resistance of this germ to external influences, especially to heat and cold, is very great. Sormani⁶ has shown that it requires from fifteen to twenty minutes' exposure to steam under pressure, or the same length of boiling, to destroy the vitality of the spores. This same author has demonstrated that completely dried and pulverized sputum retains its infectious character for weeks and months; and Pietro⁷ asserts that tubercular matter will retain its virulence ten months after drying. Putrefaction, so destructive to many bacterial forms, exerts very little influence upon the tubercle bacilli. Sormani and Voelsch⁸ claim that the vitality of the spores remained unimpaired for one hundred and eighty days in the putrefied sputum of consumptives. DeToma,⁹ however, denies this, and found that putrefaction destroys the virulence of the germs after three to nine days.

Dr. Ducor, at a meeting of the Academy of Medicine in Paris (Progrès Medical, April, 1893), reported an epidemic of tuberculosis in a family which had occupied an apartment tenanted two years before by two phthisical patients. He examined pieces of wall paper from the rooms and found Koch's bacillus. Guinea-pigs inoculated with cultures from this paper died of tuberculosis. Cadeac and Bournay, in the Sem. Méd., June 14, 1893, report experiments upon dogs and pigeons which were fed with meat infected with tuberculosis. Examination of their stools revealed the presence of the bacilli, which had lost none of their virulence.

The experiments of Wesener and Falk also indicate that the bacilli resist the action of the normal gastric juice.

The experiments of Koch, Weichselbaum,¹¹ and others prove that artificial tuberculosis can be produced in animals by inhalation of a spray containing tubercle bacilli, by feeding animals with tuberculized food, or by subjecting them to direct inoculation. Indeed, the chain of evidence is quite complete that tuberculosis is caused by the multiplication of this specific micro-organism in the tissues of the animal body, and by no other means.

In man the disease is most likely set in action by the bacilli introduced through the respiratory passages or the digestive tract, and by

the skin and mucous membranes, especially if there be a solution of continuity; but, of course, the most frequent and dangerous mode of contracting the disease is the inhalation of the bacillus suspended in the inspired air.

The evidence as to the transmissibility of bovine tuberculosis to man has been strengthened by Demme,¹² who reports four cases of intestinal tuberculosis in children, infected by the milk of a tuberculous cow, and adduces chemical and anatomical proof of his assertion. When we consider the large mortality of children under five years of age from primary tubercular ulceration of the intestines, tubercular peritonitis, and tabes mesenterica, and the fact that the food of these children consists largely of unboiled milk, we are strongly tempted to believe in the transmission of bovine tuberculosis through the milk supply.

Dr. D. E. Salmon, Chief of the Bureau of Animal Industry, in a paper read before the Pan-American Medical Congress, October 12, 1893, stated that he had no means of estimating the proportion of cases arising from infected food, but declared that tuberculosis is one of the most common diseases of milch-cows, and may affect 50, 75, or 100 per cent of the animals in large herds; the average proportion of cows affected in this country is unknown, but in dairies around our large cities from 3 to 5 per cent have been affected, when the diagnosis was made by the ordinary methods of examination. Fortunately, the milk from all tuberculous cows does not contain the bacilli, but when there are tubercles in the udder, the milk contains immense numbers of these germs. The tuberculin test is proving of immense value in the diagnosis of bovine tuberculosis, and the New York State Board of Health is killing by the hundred animals condemned by diagnoses with tuberculin. A gentleman writes to the "New York Medical Record," January 6, 1894, that his valuable herd of thoroughbred cows was twice examined by competent veterinarians, and pronounced healthy; a third examination with the aid of tuberculin caused a condemnation of over one half the herd, showing that it was impossible for the best veterinarian to discover tuberculosis by physical examination, except in extreme cases. New York, according to the "Record," evidently believes in this kind of diagnosis, and will probably have to pay \$500,000 to eradicate bovine tuberculosis.

Rieck (*Vierteljahrschrift für gericht med. und öffentl Sanitätswesen*, 1892, No. 4) reports the results of the examinations made at the Leipzig abattoir as regards tuberculosis during the years 1888 to 1891, both inclusive. During this time 67,077 cattle were slaughtered, of which 20.4 per cent were found to be tubercular.

The following illustrations of different modes of infection have been reported, viz.:

Lowenthal¹³ reports the case of a woman who slept on the right side of a tuberculous husband, and contracted a conjunctivitis of the left upper eyelid, followed by enlargement and ulceration of the glands in the parotid and submaxillary region. Excision of the original deposit revealed the presence of tubercle bacilli.

Cornil and Moore¹⁴ have shown that infection may take place through the genital mucosa, and an interesting article on chronic tubercular endometritis, referring to primary genital tuberculosis and sexual relations with tuberculous husbands, will be found in the "New York Medical Record," November 30, 1889.

Lehmann¹⁵ reports ten cases in which the virus was transmitted by the mouth of a tuberculous Rabbi, who was in the habit of applying suction to the wound after circumcision. In these cases at the end of the second week ulcerations with a gray base were noticed at the point of infection; four of the children died shortly from tubercular meningitis; three others after a more prolonged illness; one died from diphtheria, and two recovered.

Eisenberg¹⁶ reports a similar case, in which the sputum of the Rabbi was found to contain the bacilli. Tehernig, Pfeiffer, and Duering have reported instances of infection through the skin, in one case by means of expectorated phthisical blood, which infected a slight hand wound of a girl. Landouzy and Martin¹⁷ have shown that inoculation of the spermatid fluid from tuberculous guinea-pigs produced the disease in one third of the animals experimented upon. This would seem to render the transmission of the disease through the sperma probable, but Gärtner (*Zeitschrift für Hygiene und Infectious Krankheiten*, 1893, XIII, 101) believes the direct transmission of the disease to come solely from the mother, for he found it impossible in his experiments on mice, canaries, and rabbits to obtain infected offspring when the mother was healthy, even though the semen of the father was teeming with tubercle bacilli. Under these circumstances, the disease was frequently transmitted to the generative organs of the mother, but never to the foetus resulting from the contact.

Uffelmann believes that the secondary lesions of the alimentary tract may be produced by the patient's swallowing a portion of the expectoration. The most common source of infection of this tract, by means of unboiled milk and insufficiently cooked meat from animals affected with tuberculosis, has already been referred to. There is no evidence to show that the bacilli are transmitted in vaccination; in fact, Acker failed to discover the microbes in question in the lymph visicles of vaccinated phthisical subjects.

There is much reason for believing that the germs of the disease may be conveyed in clothing. I remember a well-authenticated instance where a perfectly healthy man bought the clothing worn by a consumptive, and contracted the disease within six months, and died from the effects two years thereafter. Perlen,¹⁹ in his dissertation on pulmonary tuberculosis and occupation, tells us that of 4,177 tuberculous patients treated in the Munich Poliklinik, 709 were engaged in tailoring, cleansing, and shoe shops. Whilst these figures are suggestive, it is of course impossible to estimate the number of instances in which the disease was spread by dried sputum contained in clothing.

As in other infectious diseases, the question as to whether the germs are introduced *direct*, and in sufficient numbers, is of importance.

The observations of Humphrey, Pollock, and Leudet conclusively show that in well-ventilated wards of chest and consumption hospitals, the disease is not usually found to spread.

In private practice the results are different in this respect. A French committee of investigation presents 213 cases of tuberculosis in which the communicability of the disease was clearly established. In 64 of these cases the disease was conveyed from husband to wife; in 43 from the wife to the husband; in 38 it was transmitted to brothers or sisters; in 19 from parents to the children; in 16 to distant relatives; and in 32 to outsiders. The communicability was most marked among the poorer

classes. Another collective investigation of a German medical society revealed the fact that of 938 married persons who died of acquired tuberculosis, in 101 instances either the husband or wife also contracted the disease. In 8.1 per cent of these cases the husband contracted the disease from his wife, and in 13.2 per cent the wife was infected from the husband. Other statistics might be adduced in favor of the communicability of the disease, but Zasetzky's¹⁸ observation is of special interest. He reports the case of a tuberculous woman who married between 1872 and 1883 three husbands, all previously healthy; the first husband died in 1879 of tuberculosis, the second in 1881, and the third husband, at the time of the report in 1884, was also a victim of the disease, the wife having in the meantime died of consumption.

We can only explain the greater contagiousness in such cases by a more intimate contact, the occupation of the same room and bed, common use of eating and drinking utensils, and the vitiated air of private rooms. It is very possible that the bacilli may acquire more virulent infective powers in the foul atmosphere of overcrowded rooms, and, as suggested by Dr. Ransome, the sporulation of the bacilli may be assisted by contact with the kind of organic matter found in such atmospheres.

Since Cadeac and Malet¹⁹ have proved that the bacilli are not contained in the breath of tuberculous patients, we must conclude that when found in the air of rooms occupied by phthisical patients, they originate from the dried sputum and other dejections on floors, walls, carpets, bedding, and clothing, which are converted into dust particles, and thus gain access into the air and the respiratory tract. The virus may also be conveyed to others, by small particles of sputum, in kissing, coughing, instrumental manipulations, or adhering to utensils in common use.

From what has been said and written on the subject, it is evident that the tubercle bacilli must be widely scattered; the modes of invasion are also numerous, and the wonder is that, relatively, only a few of those exposed to the virus actually contract the disease. This shows that invasion of these microbes is not sufficient to produce the disease, but that they must also find a susceptible subject for their proliferation and pathogenic effects, and hence *predisposition* in this as in other infectious diseases plays an important rôle.

Clinical experience indicates that faulty nutrition, bad air, lack of sunlight, debility, anæmia, mental anxiety, diabetes, whooping-cough, measles, and other diseases favor the development of tuberculosis.

The observations of Drs. Bowditch of Boston and Buchanan of England positively indicate that damp soils and habitations are predisposing causes to tuberculosis, and whilst this relation has not been satisfactorily explained, still it is possible that the bacilli of tuberculosis luxuriate best in such an atmosphere, as damp rooms are much more likely to contain an excess of organic matter. Another explanation may be found in the well-established fact that a damp air predisposes to catarrhal affections, or "colds," and these in turn may render the system more susceptible to the invasion of the tubercle bacilli. We also know that a predisposition may be *inherited*, as evidenced by a delicate physique, narrow chest, and general vulnerability of the tissues.

A vulnerability of the tissues to the disease may also be *acquired* by dust-producing occupations, and here the origin of the dust seems less important than the character of the particles which compose it. For

this reason, no doubt, the hard, sharp, and angular particles of iron and stone-dust are more liable to produce lesions of the respiratory mucosa. In no other way can we explain the comparative innocuity of coal dust, the particles of which are quite free from sharp points and corners. Dr. Ogle has shown in his report—in forty-fifth annual report of the Registrar-General—that coal miners stand at the head of the list as regards freedom from phthisis and other lung diseases in dust-inhaling occupations, and that the tin miners of Cornish, who inhale a sharp, angular, and most irritant stone dust, furnish the largest number of cases. In Switzerland (Lagneau) Medical Record, March 7, 1894, 10 out of 100 stone-cutters died from phthisis, and in England 340 out of 1,000 deaths occurring among these workers were from consumption. We know, of course, that occupations involving the inhalation of an unusual amount of dust tend to produce diseases of the lungs, not necessarily tubercular, but what I wish to emphasize is, that certain dust particles are apt to cause lesions of the respiratory mucosa, and hence an increased susceptibility to the invasion of the tubercle bacilli.

It is also well known that indoor, sedentary, and intellectual occupations predispose to the development of the disease. Of 1,000 deaths in Italy among students and seminarians, 459 died of phthisis. In England, of a like number of deaths in printers, 430 died of phthisis. Raseris' Italian Statistics show that college men and scientists generally furnish the greatest number, and sailors and tramps, the least number of victims to consumption. This indicates the value of out-door life; indeed, statistics conclusively show that it is quite exceptional for this disease to be the cause of death of those who live in the open air. In Switzerland, of 1,000 deaths occurring in out-door laborers and farmers, not more than one or two died from phthisis, and in a similar number of deaths in Italy among shepherds and farmers, only 44 to 54 died from this disease. Lagneau also tells us that the sanitary statistics from 662 towns in France show that the more the population is crowded, so in proportion are the inhabitants gravely affected with tuberculosis. Thanks to the climate of our State, we are permitted to enjoy practically an out-door life all the year around, and it is doubtless this, together with the fact that in many sections of the State, the average temperature is just suited for the performance of the physiological functions with the least possible strain upon any particular organ, which determine the remedial properties of our air. Such climatic virtues cannot fail to promote health and bodily vigor, and, therefore, a natural antagonism to disease.

Does climate afford immunity from tuberculosis? The evidence is not sufficient to show that any community in any climate is entirely free from pulmonary consumption, but we do know that whilst the mortality on the plains and in the valleys of Europe is about 3 per 1,000, and as high as 5 to 7 per 1,000 living in cities and towns, the inhabitants of certain mountainous districts, even under unfavorable sanitary surroundings, suffer to a far less extent—the mortality amounting in some localities at an elevation of 1,500 feet, to only 0.56 and 0.68 per 1,000.

Fuchs, quoted by Uffelmann, gives the following elevations as likely to afford immunity from consumption:

In the north temperate zones, at an elevation of	1,300-3,000 feet.
In the middle temperate zones, at an elevation of	2,000-5,000 feet.
In the tropical zones, at an elevation of	7,000-14,000 feet.

Bell, in speaking of our own country, refers favorably to the eastern highlands, the Alleghany region of Georgia, the Carolinas, Tennessee, Virginia, West Virginia, Pennsylvania, and the White Mountains, especially the pine forest region of the Atlantic States, from Virginia southerly, at an altitude of from 500 to 1,500 feet, and also the Pacific Coast, as notable regions for the small ratio of deaths from pulmonary diseases. In 1886 I called attention to the climate of Northern California and the infrequency of pneumonia and phthisis among the inhabitants of Modoc County, suggesting, in my concluding observations, that the great daily range of temperature, dry atmosphere, and elevation (4,700 feet), might be fatal to the development of the tubercle bacillus. (See Ninth Biennial Report of the State Board of Health, 1886.)

We have seen that the elevation affording immunity differs greatly in different zones; therefore, exemption cannot be attributed to the influence of diminished atmospheric pressure alone, although we must admit that diminished density of the air induces deeper inspirations, more effectual inflation and ventilation of the air vesicles, which naturally tend to increase the resistance of the pulmonary tissues to the invasion of the germs. It is possible that freedom from organic impurities in the air is the most important factor. Pasteur, Tyndall, and others have shown that the air of great altitudes is entirely free from organic impurities; and Miquel, Frankland, Petri, and others have examined the air for bacteria at different altitudes, and found the air at an elevation of between 6,000 and 7,000 feet to be quite free from germs.

Similar investigations have been made of the air of sea coasts and the high seas.

Uffelmann found between fifty to three hundred bacteria in one cubic meter of air on the Baltic coast, in the summer of 1887, and Moreau, Miquel, and Fisher ascertained that the sea air one hundred and twenty miles off the coast is absolutely free from bacteria. These facts throw a flood of light on Bowdin's statistics, which show that whilst the deaths from consumption in the English army were 10.7 per 1,000, the mortality in the navy was only 1.76 in 1,000 men.

PREVENTION OF TUBERCULOSIS.²⁰

The facts presented in the foregoing pages justify the conclusion:

1. That tuberculosis is an infectious disease caused by a microbe, transmissible to healthy individuals under certain favorable conditions.

2. Inherited and acquired predisposition plays an important rôle in the invasion and multiplication of the bacilli.

3. The germs may enter the system by the respiratory and alimentary passages, and by the skin and mucous membranes, if there be an abrasion.

4. That whilst the bacillus has been transmitted through the milk, flesh, and blood of animals and man, the most common and effective way of distributing the disease is by the dried and pulverized sputum of tuberculous patients. Heller calculates that seven thousand two hundred million of bacilli may be expectorated in a day by a single patient.

5. The habitations of consumptives, as well as their personal effects, unless immediate disinfection has been practiced, are infected houses and objects, and liable to convey the disease to subsequent occupants.

The indications for the prevention of this disease are:

1. Notice by householders and physicians to the health authorities as soon as the disease is recognized.

2. The sputum of consumptives should be received in spitcups containing a 5-per cent solution of carbolic acid, and the contents rendered innocuous by boiling for twenty minutes. The paper and wood boxes made for this purpose should be burned. All public and private buildings should be provided with spittoons. Patients who continue out of doors should use handkerchiefs to receive their expectoration, which, if old, should be burned; at all events, linen, bedding, or clothing thus soiled should not be allowed to dry, but must be thoroughly disinfected, boiled, or steamed, and laws should be enacted against spitting into places where the sputum is liable to infect others.

3. Disinfection of all houses in which tuberculosis has occurred should be made compulsory; also the disinfection of hotel rooms, sleeping-car and steamer berths which have been occupied by consumptives.

4. All objects which have come in contact with consumptives should not be given away, sold, or used by others until disinfected by steam under pressure, boiling, fumigation, or a coating with lime or corrosive sublimate solution.

5. Isolation of tuberculous patients is indicated in hospitals, asylums, and prisons. In private life the patient ought to occupy a separate room and bed, use separate eating and cooking utensils, and neither receive nor give kisses, and the family physician should encourage the treatment of such cases in special hospitals.

6. Government inspection of dairies and slaughter-houses, and the extermination of bovine tuberculosis, are urgently called for. In the absence of such laws, and as an additional precaution, cows' milk should be thoroughly boiled and meats well cooked.

7. A tuberculous mother should not nurse her infant, and great care must be taken in the selection of a wet nurse. Marriages with a tuberculous person should not only be discouraged, but absolutely prohibited by law.

8. Predisposed subjects should take special precautions; this is particularly true of those born of tuberculous parents, or belonging to consumptive families; those debilitated by privations or excesses, and those suffering or recovering from whooping-cough, measles, smallpox, diabetes, and catarrhal affections. Clinical experience teaches that it is quite possible to overcome this predisposition by improving the tone and general nutrition of the system. Apart from medication, careful and methodical gymnastics, attention to the skin, and other hygienic rules will prove of special value. Let us insist on the purity of the air in our houses and towns, and guard against dark, damp, and unsanitary habitations.

9. The establishment of sanitary boarding-schools in salubrious localities, for children predisposed to tuberculosis, in which special attention is paid to their physical culture, appears earnestly called for, and in choosing a subsequent vocation for them, it is important to avoid occupations involving sedentary habits and indoor work, especially in a dusty atmosphere.

10. Last, but not least, the public should be educated that this fatal malady is a communicable disease, how it may be acquired and prevented, and this duty devolves not only upon the medical profession, but also upon the press, state, school, and church.

Mr. President, and members of the Sanitary Convention, I am well aware that much mental distress will be engendered by the enforcement of the rules just formulated. But the very fact that 15 per cent of the community are victims of this fatal disease, would more than justify such enlightened legislation as even the prohibition of marriages with a tuberculous person. There is entirely too much sentiment on the subject of individual rights. The annals of medicine teach us, that men and women afflicted with a communicable disease are dangerous to society, and it is the duty of the State to take what precautions it can to prevent mischief.

Legislators have a right to look to our medical societies and health departments for intelligent advice on matters affecting public health, and if a medical body recommends means for the prevention or spread of communicable diseases, they should be accepted in a practical sense and embodied in *effective* laws.

Whilst a conservative spirit should ever animate our profession, we should also possess the courage of our convictions; and yet, there are men eminent in our ranks, whilst not hesitating for a moment to urge the most heroic measures for the prevention of cholera, yellow fever, and smallpox, who absolutely oppose the enforcement of efficient means for preventing the dissemination of consumption, universally admitted to be the most fatal of all communicable diseases. For my own part I fail to see the difference upon which such distinctions are based. Whilst cholera, yellow fever, and smallpox strike terror into a community, because these diseases occur in epidemics and are rapidly fatal, we know that consumption demands more victims than all these diseases combined.

The question of marriage not only involves the prevention of tuberculosis, but other communicable diseases, and no one knows better than the members of the medical profession what an excess of pain and sorrow, what an ocean of tears and blood might have been prevented, if exemption from communicable diseases in candidates for marriage were as mandatory as the question of age and race for the procurement of a license. I believe few men and women will be found unwilling to undergo an examination by their family physician for the detection of infectious diseases, the existence of which not only affects the welfare of a husband or wife, but also their offspring and the community at large, and all those who are so devoid of a feeling of responsibility as to willingly and knowingly inflict a fatal malady upon others, certainly deserve little consideration at the hands of society.

I sincerely hope that this convention will take a progressive step in a question which has occupied and cannot fail to agitate the minds of earnest men and women, and whilst we may meet with opposition, we know our cause to be just, and can confidently rely upon the intelligence and good intentions of the American people, that the cause of humanity will ultimately triumph.

¹ Billings, J. S. Cartwright Lectures, N. Y. Med. Record; December 14, 1889.

² Koch, R. Mittheil: aus dem k. Gesundheitsamte, II.

³ Cornet. Zeitschr. f. Hygiene, V, 191.

⁴ Cadeac & Malet. Rev. de Medicine; 1887, No. 7.

⁵ Uffelmann, J. Handbuch der Hygiene, p. 580; 1890.

⁶ Sormani, quoted by Uffelmann.

⁷ Pietro, quoted by California Health Board; November, 1889.

⁸ Voelsch, in Ziegler's Beiträgen zur pathol. anatomie, II, 2.

- ⁹ De Toma. Centralblatt f. d. med. Wissen, 1888.
- ¹⁰ Falk. Virchow's archiv, 93.
- ¹¹ Weichselbaum. Zeitschr. der Wiener arzte, 1883. 2 Heft.
- ¹² Demme. Jahresbericht des Jennerschen Kinderspitals. Bern, 1882.
- ¹³ Lowenthal. Impftuberculose der Conjunctiva, 1887.
- ¹⁴ Moore. Pacific Record; November 15, 1888.
- ¹⁵ Lehmann. Deutsche Med. Wochenschr.; 1886; Nos. 9 and 10.
- ¹⁶ Eisenberg. Berlin klin Wochenschr.; 1886; No. 35.
- ¹⁷ Landouzy & Martin, in Verneuil Etudes exper. et cliniques. Paris, 1887.
- ¹⁸ Zasetzky. Wrutsch; 1884.
- ¹⁹ Perlen. Lungenschwindsucht und Leruf. München, 1887.
- ²⁰ American Jour. of Med. Sciences; January, 1890; pp. 78-79.

THE RELATIONSHIP EXISTING BETWEEN BOVINE AND HUMAN TUBERCULOSIS.

By R. A. ARCHIBALD, D.V.S., of Sacramento, Cal.

MR. PRESIDENT AND GENTLEMEN: I have availed myself of the opportunity offered by this convention to present for your consideration "The Relationship Existing between Bovine and Human Tuberculosis," a subject which is, in my estimation, the most important which you, as sanitarians, will have to consider in the near future; and having read the notification of this meeting issued by the Secretary, I am lead to believe that this convention intends to take active measures to control this disease.

I have taken up this subject, not with the idea of presenting to your notice anything new or original, nor have I any idea that I can tell you gentlemen anything that you are not already cognizant of, but I simply wish to call your attention and refresh your memory by offering for your consideration a compilation of a few facts and statistics connected with this subject, so that when you come to consider what steps it will be necessary to take in order to suppress and stamp out this disease you will not forget the fact that bovine tuberculosis is identical with human tuberculosis.

I do not propose to enter into the ætiology, pathology, etc., of the disease, but shall confine myself to the origin, transmissibility, the use of tuberculin as a diagnostic agent, and the prevention of the disease.

ORIGIN OF THE DISEASE.

This insidious, delusive disease differs from nearly all other diseases, in that it is not the result of civilization, as many suppose. Barbarous and uncivilized races are affected as severely as many of the most advanced civilized races.

Neither geographical position nor climatic conditions are a factor in the distribution of the disease, notwithstanding that some of our best writers have attempted to account for its prevalence in certain localities by reason of temperature or meteorological influences; nevertheless, every known part of the globe, with a few isolated areas excluded, is a habitat of the disease.

After several years of close study of this affection, and consulting all accessible statistics and the habits of the people where the disease prevails, I have reached the conclusion that the only constant associated factor is found in the bovine species, without any regard to the social position of a community, its geographical habitation, terrestrial or atmospheric condition.

There are undoubtedly conditions of climate, habitations, etc., that favor the development of the disease, if the contagion is present; but this contagion, as I stated before, is most often derived primarily from the dairy cow. Therefore, if a community is closely associated with dairy cattle, tuberculosis prevails.

In establishing proof of the position I have taken in this matter, I would like to give you the history of a great many countries which, before the introduction of the dairy cow, experienced perfect immunity from this disease, but after the introduction of the milch cow into these countries, we have been told by men of undoubted authority that the disease became prevalent.

Owing, however, to my unwillingness to take up too much of your valuable time, I will only at the present cite you a few instances, at the same time assuring you of the fact that I could, if it were necessary, cite you a great number of cases to establish proof of the position taken by me in this matter.

We will take, for instance, the country called the great Kabylia, in Africa, which is occupied by a semi-civilized race of people, who—according to such eminent writers as Hersch, Evans, and other noted French authors—enjoyed an absolute immunity from consumption. According to Morell, Daumas, and other historians, there is no evidence of the presence of the bovine tribe among them; but these people possess large flocks of sheep and goats, and each family has usually one buffalo ox to do its plowing. As these are a peculiar race of people, with peculiar ideas and habits, not calculated to encourage visits from Europeans, they retain their immunity from consumption to the present day. But not so with their neighbors, the Algerians. When this country was first occupied by the French, half a century ago, the natives were enjoying an absolute immunity from tuberculosis, but after the French imported dairy stock in 1854 the statistics of the death-rate by Jackson, in his Medical Climatology, show that consumption was the cause of a large percentage of deaths among the natives.

And there are a great many other countries furnishing reliable statistics of the death-rate from consumption where the disease is not indigenous, but due to importation through the medium of dairy cattle. Such countries, for instance, as Australia, China, Greece, Greenland, central and upper Egypt, Iceland, certain parts of Russia, the Hebrides, and others.

Without going further into details respecting separate communities, let us consider for a moment the statistics of Europe, and there we find the prevalence of tuberculosis is regulated by the ratio of the bovine to the human race. Thus, in Ireland, where the cattle number 4,570,000, nearly an equal proportion to that of the inhabitants, according to Dr. Wylde, consumption is by far the most fatal affection to which the inhabitants of that country are subject. Denmark, with about the same ratio of cattle to inhabitants, sustains about the same rate of consumption. In Portugal, where there are six inhabitants to one bovine animal, consumption attracts so little attention that few notices can be found relating to the disease in that country. In Italy, the distribution of cattle being one to six inhabitants, the mortality reaches an exceedingly low rate. Also in lower Egypt, where the ratio is one animal to about thirty inhabitants, Pruner tells us that the disease is very rare.

Thus the statistics go on, and where exceptions arise the cause is always evident in the condition that influences the breeds of cattle. Taking into consideration all the foregoing facts, there can be little doubt that the inbred species of the bovine race is the prime ætiological factor of consumption in the human race. They not only nurse the germ and prevent its extinction, but sow it in the human race continually and abundantly; and when we consider the comparatively few of the human race who are affected, and the immense number who are exposed to the

infection and escape it, we are led to believe that without their aid the germ would die, for of all the germs known none have so hard a struggle for existence in the human family as the tubercle bacillus.

Man cannot generate new forms, but he can so control and interfere with nature's processes as to modify the original design. Inbred cattle are selected, sheltered, and pampered, as they would be unable to withstand the vigorous conditions of the wild state; they propagate earlier, are larger milkers and more efficient beef-producers, and their meat is more delicate and tender than that of the wild animal. All this is achieved by man at the expense of his own health.

THE TRANSMISSIBILITY OF THE DISEASE.

It has been demonstrated beyond a shadow of a doubt by actual investigations, by such eminent German investigators as Gerlach, Villemin, Klebs, Orth, Ernst, Peters, and others, and by such noted American investigators as Salmon, Law, Smith, Schroeder, Pearson, and others, that the milk from tuberculous cows is exceedingly dangerous to the consumer. They have proven this by feeding to such animals as the hog, dog, guinea-pig, and other animals that are not so susceptible as man, the milk from diseased cows, and they have shown that even where the udder of the cow is not affected, the milk is dangerous in 55 per cent of cases.

Now, in regard to the consumption of the meat of tuberculous animals, we realize, so far as becoming inoculated with the germ is concerned, the danger is not very great, for we all are aware that the act of cooking will destroy the tubercle bacillus. But the question of the presence or absence of ptomaines or other toxic elements which are calculated to prove hurtful or even fatal to certain members of the human family, is not for a moment considered. We are constantly met with the argument that tubercle is rare in the muscular system of cattle, and that therefore the muscular tissue may be safely eaten, even though the internal organs are affected. We are also met with the argument that the milk and other dairy products are harmless, so long as the udder is free from tubercle. We admit that if the meat and milk are exposed to the temperature of 100° C., the bacilli are destroyed, but the fact that the germ is destroyed does not, in our estimation, render the produce harmless.

While we are considering the dangers of tubercular infection, we should not lose sight of the no less dangerous element, tubercular poisoning.

Let us for a moment consider this important matter. We all know that Koch's tuberculin has retained a considerable quantity of the toxic matter produced by the growth of the bacillus, after it has been sterilized, and we all know the action of a small dose of tuberculin on a human being or animal suffering from tuberculosis. In such a case the subject may have acquired a tolerance against the products of the existing tubercle to the extent that there is no manifest disturbance of health. But add to these products of the existing tubercle a small quantity of tuberculin, and in ten to fifteen hours the temperature of the subject's body will rise two or more degrees above normal, and the destructive process of the existing tubercle will be accelerated.

It is this extension of tuberculosis under the influence of the toxic products of the bacillus which raises a very important question, which we as sanitarians should on no account overlook. We should remember that all the soluble toxic products of the bacillus are constantly circulating in the blood, and also through the mammary glands, where it escapes

into the milk. Though some may dispute the idea that the germ is carried and distributed through the muscular system, it is impossible to dispute the fact that the product of the germ does find its way to all parts of the body through the circulation. Knowing, then, beyond doubt the presence of the toxins in the flesh and milk, it follows that those who partake of the flesh and milk are continually taking small doses of tuberculin. And if we now consider the prevalence of tuberculosis in the human family, and realize that 12 per cent of deaths in the human family are due to tuberculosis, we see what a fearful risk is being run by the consumption of the meat and milk of animals affected with this disease, even if it could be shown that the products had been sterilized by boiling. This we can readily believe, knowing that sterilization is not a restoration to a non-toxic condition. While it is true that it does away with the possibility of infection, yet it does not render the product innocuous, and it is easy to see that the consumption of these products is a direct means of sealing the fate of a large proportion of a community which is already slightly affected with consumption.

We know that the sputa of a consumptive person is one of the most prevalent mediums of infection to his fellow men, but we overlook the fact that while tuberculous cattle cannot expectorate, yet owing to the pendent position of the head the discharge is continually dropping on the ground; it then dries up and is sown broadcast over the country by the wind.

The milk obtained from the family cow is a source of even greater danger than the milk obtained from dairies, for the reason that dairy milk, even though some of it may have been taken from the udders of tuberculous cows, loses, to a certain extent, a great deal of its virulency when mixed with milk from healthy animals.

TUBERCULIN AS A DIAGNOSTIC AGENT.

I am sure it is unnecessary on my part to enter into a detailed description of tuberculin, for the reason that I believe you gentlemen are familiar with its composition, etc. Not to be too prolix, it will suffice to say, then, that tuberculin is the substance which was claimed by Koch to have curative properties in the treatment of tuberculosis. As a curative agent we know it was a failure; as a diagnostic agent, however, it has given results which have in many respects revolutionized the methods of inspecting dairy cattle for tuberculosis. With this agent it is possible to detect tubercular lesions which defy detection by auscultation, percussion, or other physical methods of diagnosis.

By the injection of 0.25 cc. of tuberculin a reaction will occur in every case where tuberculosis exists in the animal, and will not occur in an animal free from the disease.

In the examination of dairy cattle without the use of tuberculin it is impossible for the most expert inspector to guarantee the products of a dairy as being fit for human consumption. And those who pretend to weed out tuberculous animals from a herd without the use of this agent are merely imposing on the public and health authorities who employ them.

That tuberculin is a valuable aid in the diagnosis of tuberculosis is beyond question, but it should only be used in conjunction with the ordinary methods of examination, and it should only be used by those familiar with the disease.

PREVENTION.

In regard to the suppression and eradication of tuberculosis, we must bear in mind that the disease is not confined to one species of animal, but may be communicated to, and by, all animals. As long as there remains one tubercular individual, whether man or beast, there will be danger to all other animals.

By the use of tuberculin it is possible to isolate the diseased animals and make sure that those remaining are free from tuberculosis.

After the diseased animals have been removed the stable and surroundings should be thoroughly disinfected, and the herd should be submitted to tests with tuberculin at regular intervals.

Before permitting any dairy to put its produce on the market the tuberculin test should be applied, and a license be issued to each and every dairy, and any one marketing the produce of a dairy without a license should be prosecuted to the full extent of the law.

In case of butcher meats, until private slaughter-houses are abolished, it will be very difficult to conduct a system of meat inspection satisfactorily; but in time we hope to see each municipality owning and controlling its own abattoir, where all its meat supplies must be slaughtered and dressed. Then, by making a thorough examination before and after slaughtering, it will be possible to supply the public with an article of diet which is not only free from bacteria, but from all toxic elements produced by bacteria.

In order to accomplish all this, we must have suitable laws and ordinances, and these laws and ordinances should be enforced by competent inspectors. The time has passed when the public in this respect have been left to the tender mercies of a politician, whose appointment to the office of inspector was not due to his ability or knowledge, but because he had a "pull." The inspectors should be appointed by the government, whether it be for a city, county, or State, and it is the duty of the government to employ men who, through knowledge gained by hard study and experience, are familiar with and capable of recognizing this and all other diseases which are dangerous to human life. These men should be paid by the government, and not by the dairymen or owners of slaughter or packing-houses, as no inspector employed by these men can furnish a certificate of health which will be received with confidence by the public.

The members of our State Board of Health, who are here with us to-day, I venture to say, realize the necessity of a concerted action on our part to assist them in laying this matter before our legislators, and show them the necessity of providing laws and ordinances for the purification of our dairy herds, and of slaughter-houses, where all animal products destined for human consumption will be subjected to a rigid inspection by government inspectors.

I will now close, hoping that all those present to-day will leave here with the fixed intention to take the matter up, and endeavor by every means in their power to assist in getting legislation, armed with which our health authorities can place this great and glorious State in a position where she will be second to no other country in the world from a sanitary standpoint.

Gentlemen, I thank you for your kind attention.

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